MINING WORLD

in this issue

Reserve's Taconite Program

Page 28

Vol. 14 No. 13

DECEMBER, 1952

35 cents a copy
In sterling 3s

SMALL SIZE TUNNELS

With a minimum of 5 feet in finished size may be loaded out with Eimcos if all conditions are properly analyzed. The tunnel shown will finish 5 ft. inside height.

EIMCO 6415

THE EIMCO CORPORATION

The World's Largest Manufacturers of Underground Rock Loading Machines

EXECUTIVE OFFICES AND FACTORIES: SALT LAKE CITY 10, UTAH, U. S. A.

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IN FRANCE SOCIETE EIMCO PARIS FRANCE
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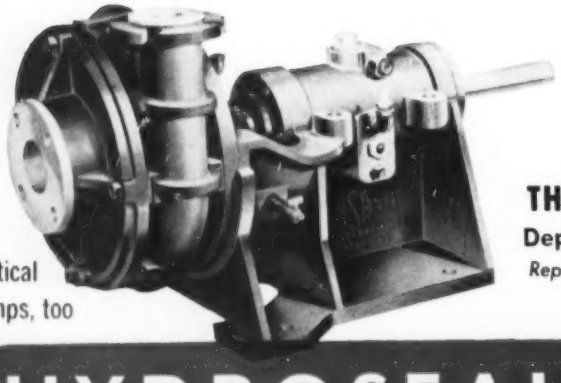
How to get more pump for your money

Here are two good questions to ask when you're in the market for abrasive-handling pumps:

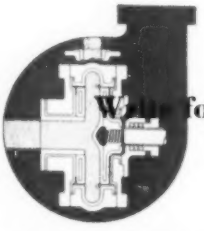
1. Can they be installed for a **suction lift?**

2. Will they operate with extreme **inlet pressures?**

Hydroseals take both of these adverse conditions in stride, and thereby allow more flexible installation. Location is not limited to small inlet heads and other restrictive features of design. Get the facts and you'll get Hydroseals.



Vertical pumps, too



Write for our latest catalog

THE ALLEN-SHERMAN-HOFF PUMP CO.
Dept. J—259 E. Lancaster Ave., Wynnewood, Pa.
Representatives throughout the World

HYDROSEAL SAND, SLURRY & DREDGE PUMPS
MAXIMIX RUBBER PROTECTED

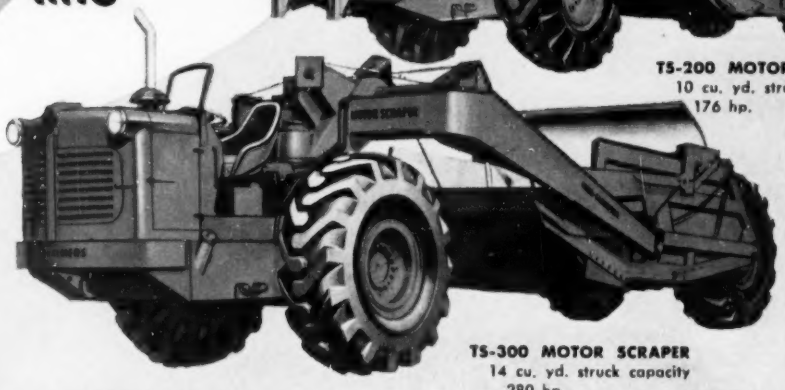
HYDROSEAL, PACKLESS AND MAXIMIX DESIGNS ARE COVERED BY PATENTS AND APPLICATIONS IN THE MAJOR MINING CENTERS OF THE WORLD

TW-300 MOTOR WAGON
Bottom Dump
14 cu. yd. struck capacity
280 hp.

Now... the famous MOTOR SCRAPER joins the A-C line

TR-200 MOTOR WAGON
Rear Dump
11 cu. yd. struck capacity
176 hp.

TS-200 MOTOR SCRAPER
10 cu. yd. struck capacity
176 hp.



TS-300 MOTOR SCRAPER
14 cu. yd. struck capacity
280 hp.

...the Finest Line on Earth

In order to serve you more completely, Allis-Chalmers has extended the *Finest Line on Earth* by adding the famous MOTOR SCRAPERS and MOTOR WAGONS formerly manufactured by LaPlant-Choate. This customer-accepted line meets A-C's 4-point quality requirements in every way.

These big self-propelled units are *designed for your job* . . . easy loading, high-speed hauling and quick, clean ejection. They're *built to take it* . . . job-tested, job-proved through years of use all over the world. Like Allis-Chalmers' other earth-moving equipment, the MOTOR SCRAPER is *easy to operate . . . simple to service.*

Today's jobs require a more careful selection of equipment. That's why you'll be money ahead if you make your nearby industrial A-C dealer your headquarters for crawler tractors, motor graders, MOTOR SCRAPERS and MOTOR WAGONS. Stop in soon to discuss your job requirements and see his complete parts and service facilities.

ALLIS-CHALMERS
TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

Men who depend on power...know they can depend on CUMMINS®

Every CUMMINS DIESEL is built not once but twice

Miners have learned to count on Cummins Diesels for dependable power day in, day out. What's behind this consistent reliability? One good reason is the fact that every Cummins Diesel is actually built *twice*. After initial assembly, and run-in testing, every engine is disassembled, inspected; then reassembled and tested again.

This extra care—together with Cummins' economy-proved fuel system and efficient parts and service organization—makes lightweight, high-speed (50-550 h.p.) Cummins Diesels a wise first choice *for men who depend on power.*

Whatever your power needs . . . whether it's for stripping or hauling, portable power units or generator sets . . . or any other important jobs . . . your Cummins dealer is the man to see.

(M-8681)

CUMMINS ENGINE COMPANY, INC., Columbus, Indiana

Export: Cummins Diesel Export Corporation • Columbus, Indiana, U.S.A. • Cable: CUMDIEX

CUMMINS Diesel

TRADEMARK REG. U. S. PAT. OFF.

***Leaders* in lightweight, high-speed diesel power!**

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Branch: BAKERSFIELD. *Authorized Sales & Service:* BLYTHE, Leo's Diesel Service; COLTON, Smith's Diesel Sales; EL CENTRO, Rhyne's Automotive Service; SAN LUIS OBISPO, San Luis Truck Service; SAN DIEGO, F. R. Laux Diesel Service; SANTA MARIA, Hanson Equipment Co.; BAKER, Newton Automotive Service.

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SPOKANE: Cummins Diesel Sales, Inc.
Authorized Sales & Service: MISSOULA, Taber's Truck Stop.

(9-22-52)

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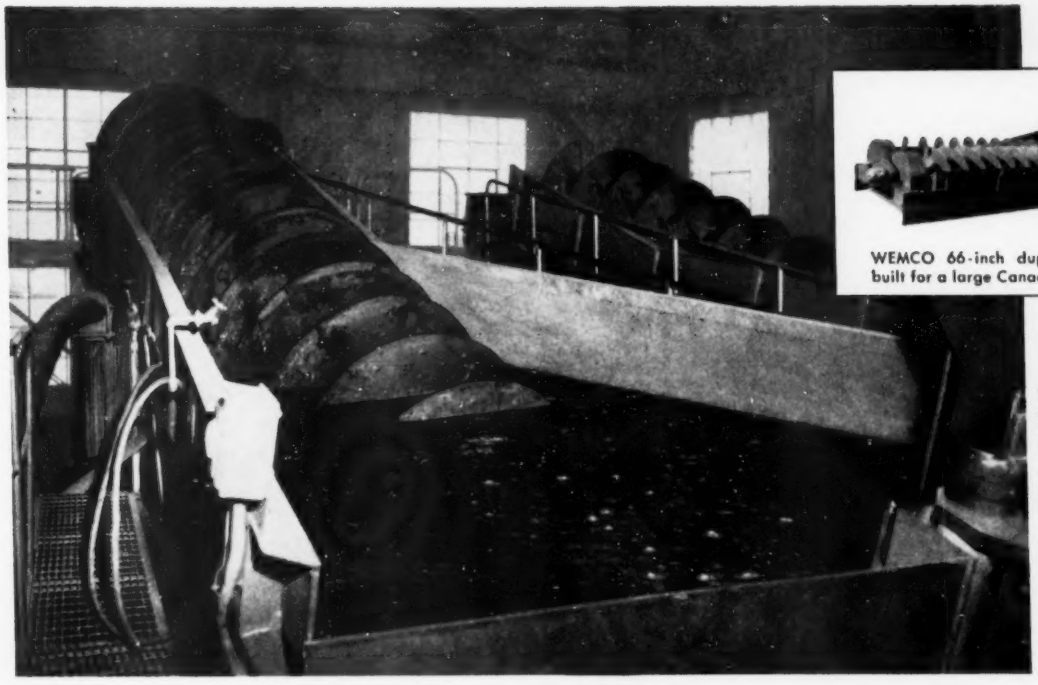

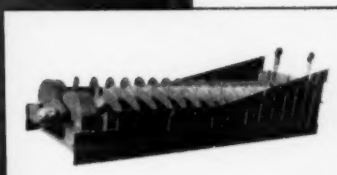

WEMCO 66-inch duplex classifier built for a large Canadian operator.

Two 60-inch, series 150 WEMCO S-H Classifiers in the regrind circuit of a large lead-zinc concentrator.

for better Classifier performance

in terms of

- *Less Oversize in Overflow*
- *Less Undersize in Sands*
- *Lower Operating Costs*
- *Longer Continuous Operation*
- *Greater Capacities*

—use ***WEMCO*** *S-H Classifiers*

These Exclusive Mechanical Features *of WEMCO S-H Classifiers are among the important reasons why* ***only*** *the WEMCO unit gives you these better performance factors — with the result that more and more operators throughout the world are choosing WEMCO for their classification jobs.*

1. **40% greater shaft strength,** for protection against shutdowns, is provided by WEMCO's large diameter tubular shafting.
2. **Longer-life wearing shoes** of tough, thick alloy and large cross-section, short cast steel flight arms. Shoe replacement costs have been reported as low as 4/100 of 1 cent per ton.
3. **Foolproof, efficient bearing units** are of the anti-friction type. Lower unit is grit-proof; upper unit is gudgeon type mounted on hub of bevel gear, designed for extra long life.
4. **Simple, hydraulic lifting device** gives uniform action and complete protection from clogging or jamming.
5. **Smooth, efficient drive** uses standard speed motors and a new type cone gear reducer for maximum efficiency of power transmission.

Consult with WEMCO today on your classification problems. Competent engineering of your inquiry will be handled promptly and places you under no obligation.

WEMCO
WESTERN MACHINERY COMPANY
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Mobil-Mills • Coal Spirals • HMS Thickeners • HMS Pumps • Sand Pumps • Cone Separators • Drum Separators • Fagergren Laboratory Units • Agitators • Fagergren & Steffensen Flotation Machines • Hydroseparators • S-H Classifiers • HMS Laboratory Units • Dewatering Spirals • Thickeners • Conditioners • Densifiers • Attrition Machines

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Tournarocker turns 90° in 12'4" radius, spots fast despite restricted quarters on quarry ledge . . . with 5 to 6 passes from loader gets 7 heaped yds. in 2 to 3 min.

At hopper, Tournarocker dumps entire load in average of 15 seconds. Rig operates 10 hours per day, 6 days per week, supplies 100% of Olaton crusher requirements.

this application whips tight quarters of Kentucky quarry

Fort Hartford teams D Tournarocker with front-end loader

To speed limestone delivery from a new hillside quarry to their crusher at Olaton, Fort Hartford Stone Quarry of Hartford tried teaming a highly-maneuverable D Tournarocker with a 1¼-yd. front-end loader. This team worked so successfully in the cramped quarters of the quarry ledge, that the 9-ton "D" now supplies 100% of crusher requirements. Here's typical production:

52½ bank yds. hourly on 300′ haul

With 7′ loading height and low rear entry, Fort Hartford's Tournarocker is heaped with 7 yards of shot rock in 2 to 3 minutes. Short 300′ one-way haul to crusher takes only 20 seconds . . . dump, return, and spot, from 1 to 1½ minutes . . . complete 600′ cycle, 4 minutes. Output per 50-minute hour averages 12½ loads or 52½ bank yards (40% voids). To minimize spotting time in the highly restricted loading area, the mobile, electric-control Rear-Dump unit turns 90° within a radius of 12′4″.

"Thoroughly sold," says President

"We're thoroughly sold on the Tournarocker," says A. C. Hall, President of Fort Hartford. "It maneuvers well on our works where tight quarters are the general rule. We like it very much." The Company, a subsidiary of Fort Hartford Coal Company, also uses their "D" to haul overburden. Their year-around operation clearly demonstrates that the 9-ton D Tournarocker can be profitably loaded with small front-end loaders.

To find out how versatile rear-dump Tournarockers can add to *your* profits, have your LeTourneau Distributor show you owner-verified reports on work similar to your own. Ask him how Tournarocker's many revolutionary features can help increase your production . . . provide greater operating safety . . . and lower maintenance costs. There's a size to fit your needs . . . 9, 18, 35, or 50 tons.

High-speed, rubber-tired excavating hauling • lifting equipment

R. G. LeTOURNEAU, INC., Peoria, Illinois

7′ loading height and low rear entry speed loading . . . 3-ply steel-grid bowl takes shocks of loading big-chunk limestone, requires minimum patching and welding.

Hauling from pit to crusher, Tournarocker's 4-wheel Multi-disc air brakes provided sure control at all times. Unit safely worked over 16% grades while stripping overburden.

Here's the NEW PACIFIC-

6" WIDE THROAT CARRYING BLOCK

Above and at right –
MODEL 6 WT WITH SHACKLE
WEIGHT 33½ LBS.

Left –
MODEL 6 WT WITH HOOK
WEIGHT 35½ LBS.

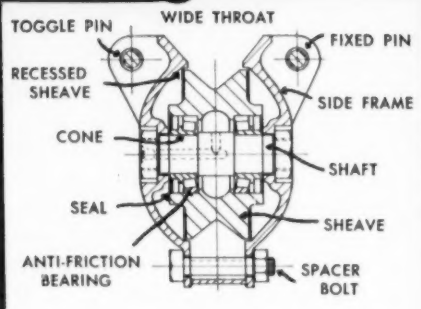
TOGGLE PINS INCLUDED AS STANDARD EQUIPMENT.

SPACER
IS INTEGRAL PART
OF SIDE FRAMES

These blocks will keep your tail ropes out of the muck. The wide throat of shackle suspended model will carry any size rope ordinarily used in slushing operations and will pass a 1⅛" square knot.

They're designed by men who know underground mining. Take one apart and you'll see why they'll *stay* underground ... and give you years of dependable, trouble-free service.

For complete information on this and the *complete line* of Pacific Sheave Blocks, send now for new bulletin No. 238.



Solid side frames. Extra-heavy construction of both groove and flanges. Made of heat-treated alloy steel for maximum toughness. Sheave is recessed into side frames to prevent rope fouling. Roller bearings are grease-sealed to prevent entrance of foreign matter.

ALLOY STEEL & METALS CO.

1848 EAST 55TH STREET, LOS ANGELES 58, CALIFORNIA

Mailing Address: Box 15323 Vernon Station, Los Angeles

"Big Red" TD 24 digs deep at Mesabi

"BIG RED" BLENDS ORE with a bulldozer in one of Mesabi's huge open pit mines. The TD-24's 148 maximum drawbar horsepower makes this hard job easy. So do its pivot-turns, feather-turns, turns with power on both tracks; its 8 speeds forward, and 8 reverse; its instant, all-weather, push-button starting—plenty important when the temperature drops! These advantages make the TD-24 the Champ for sure!

International TD-24 helps keep production high

One reason the great Mesabi iron range keeps right on supplying the bulk of the nation's ore—in spite of dire warnings by mining alarmists over the past twenty years—is the growing use of bigger, better machines to keep costs down even though today's ores are lower quality and harder to get.

For example, big red International TD-24 crawler tractors—the fastest and most powerful crawlers on the market—master many tough Mesabi jobs:

They strip off ever-deeper layers of overburden.

They constantly build new mine roads in Mesabi's great open pits—build them faster and easier than ever before.

They relocate railroad roadbeds the same way—again deep in the pits themselves.

They bulldoze together high-grade and low-grade ores, make usable blends to ship to the steel mills.

As a result of such ingenious and increasing use of modern machines, six tons of material is removed per man-hour today, where less than four tons were removed per man-hour in 1931.

For details on the great TD-24, see your International Industrial Distributor. You'll be a TD-24 man yourself from then on in!

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.

INTERNATIONAL POWER THAT PAYS

ANNOUNCING THE NEW LORAIN SCOOP SHOVEL

SCOOP OF THE YEAR

Here is a new, revolutionary, high-speed loading tool for mines, pits and stockpiles! It's the LORAIN SCOOP SHOVEL, a new front end attachment for the popular Lorain TL-25 "Series". This new front-end loader eliminates the *travel* phase of the loading cycle. The *turntable swings a full 360°* to dig and dump — no travel movement is required. With its extra-long reach of 24 feet, the Scoop Shovel can work a wide radius with no crawler motion. The job can be "cleaned up" easily — trucks can move in close for efficient, time-saving loading. And— the Scoop Shovel can load on the down-grade, on the level and on up-grade. Standard bucket capacity is 1-1/4 cu. yd. and the bucket can lift to a dumping height of 14 feet to load into the largest hauling units. Operator visibility is at its very best.

Investigate this NEW method of high speed loading that gives you the EXTRA advantages of complete convertibility to all five other front ends.

THE THEW SHOVEL CO., LORAIN, OHIO

LOW HEIGHT is ideal for low headroom operations, such as this underground mine where the Scoop Shovel is shown loading a hauling unit. Note how the bucket is extended on the telescopic boom to "reach out" to the wagon.

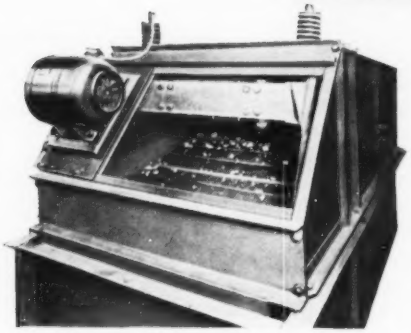
NEW HAVEN TRAP ROCK CO., New Branford, Conn. loads trucks in record time because of big bucket capacity and fast action of their Lorain TL-25K Scoop Shovel. Note excellent operator visibility and accurate load spotting.

ATTENTION: **LORAIN TL-25 OWNERS** *. . . The new Scoop Shovel can be attached to your present machine, quickly and easily. And you can reconvert to other front-ends at any time. Ask your Thew-Lorain Distributor for the story.*

THEW LORAIN®

Here is the screen you need for extremely *fine* separations

...the new "SYMONS" V SCREEN



"SYMONS" ROD DECK SCREEN . . . employs a highly efficient screen deck, utilizing individual replaceable spring steel rods. Features low screening cost—big capacity—low maintenance—long life—ideal for moist and sticky materials.

THE "SYMONS" V (vertical) Screen is the newest addition to the well-known line of "SYMONS" Screens . . . and provides extremely fine, single cut wet or dry separations.

Revolutionary in design, and operating with a combination of centrifugal action and gyratory movement, this new screen has proved ideally suited for sand, gravel and crushed stone plants—metallic and non-metallic mining—chemical plants—cement plants—coal preparation plants—and scores of other industrial applications.

Requiring a minimum of floor space, the "SYMONS" V Screen is easily installed, and provides fully enclosed construction to assure dustless operation—yet access to the screen is simplified through easily removable covers. *Write for further details.*

NORDBERG MFG. CO., *Milwaukee, Wis.*

S252

"SYMONS" . . . a Nordberg trade mark known throughout the world

NORDBERG

MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

NEW YORK • SAN FRANCISCO • DULUTH • WASHINGTON • TORONTO

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"SYMONS" Primary Crushers

Grinding Mills

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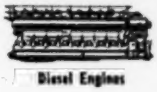
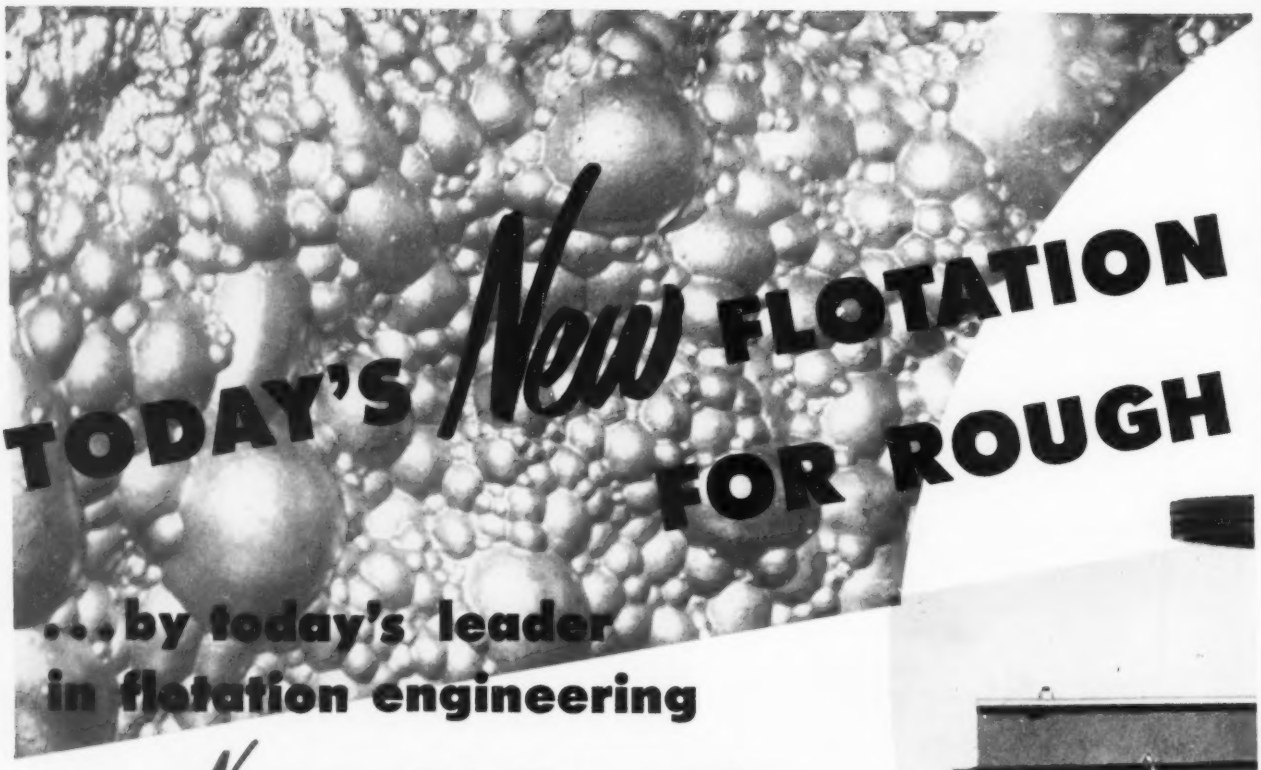
"SYMONS" Vibrating Bar Grizzlies and Screens

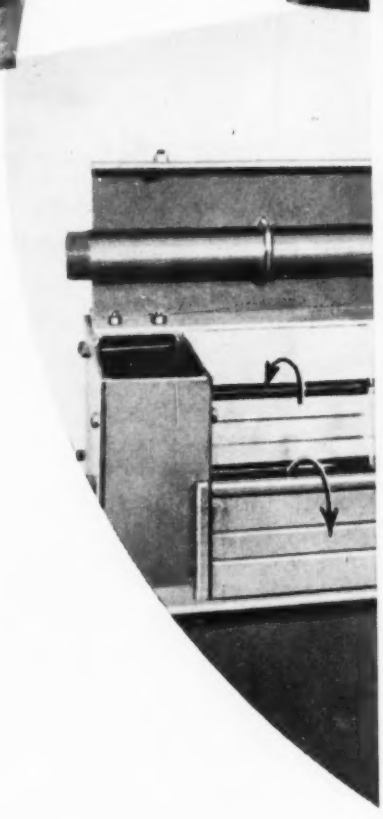


Diesel Engines



TODAY'S *New* FLOTATION FOR ROUGH

...by today's leader in flotation engineering



New Denver "Sub-A" Super-Rougher Flotation Machine gets you more values from roughing and scavenging circuits

You get more profits from your ore with the NEW Denver "Sub-A" Super-Rougher Flotation Machine—developed especially for low-grade ores. Yesterday's tailings may be today's profits, because of the price of metal. The Denver "Sub-A" Super-Rougher Flotation Machine is designed to get these extra profits out of your scavenging and roughing circuits!

This Denver "Sub-A" Super-Rougher Flotation Machine gives you the intense aeration necessary to get the most values from your roughing and scavenging circuits.

Controlled feed to the agitation chamber, supercharged aeration, an adjustable sand relief opening, and controlled pulp level give the flexibility in this low level, double overflow flotation machine that your flotation engineer *must* have for maximum results and profits.

Phone, write or wire today for more information! Find out how you can reduce tailings values and increase your mill efficiency by using Denver "Sub-A" Flotation—the world's leading manufacturer of flotation machines.

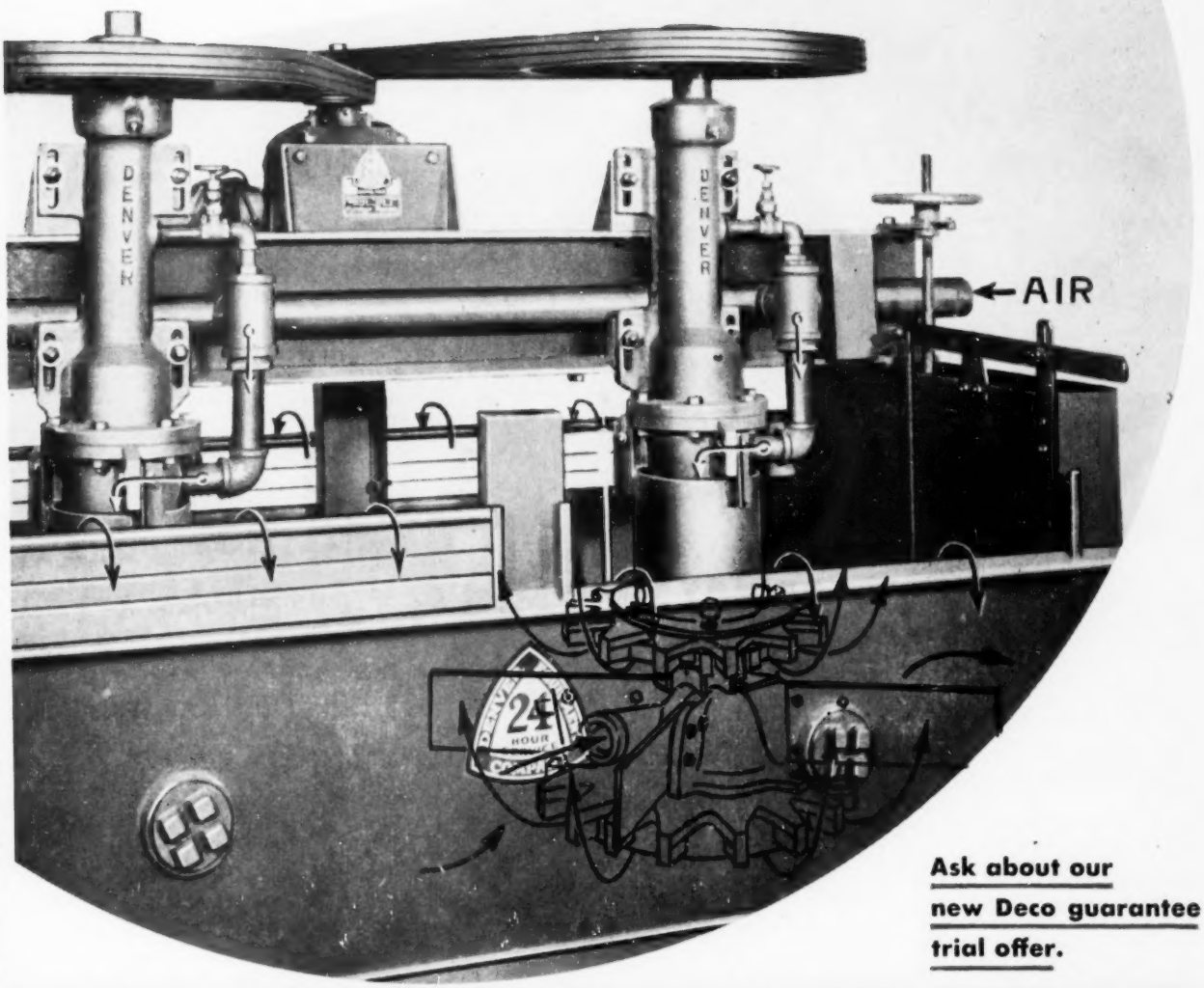
Patented and Patents Pending

DECO FLOTATION ENGINEERS — DENVER EQUIPMENT COMPANY — 24 HOUR SERVICE

DENVER

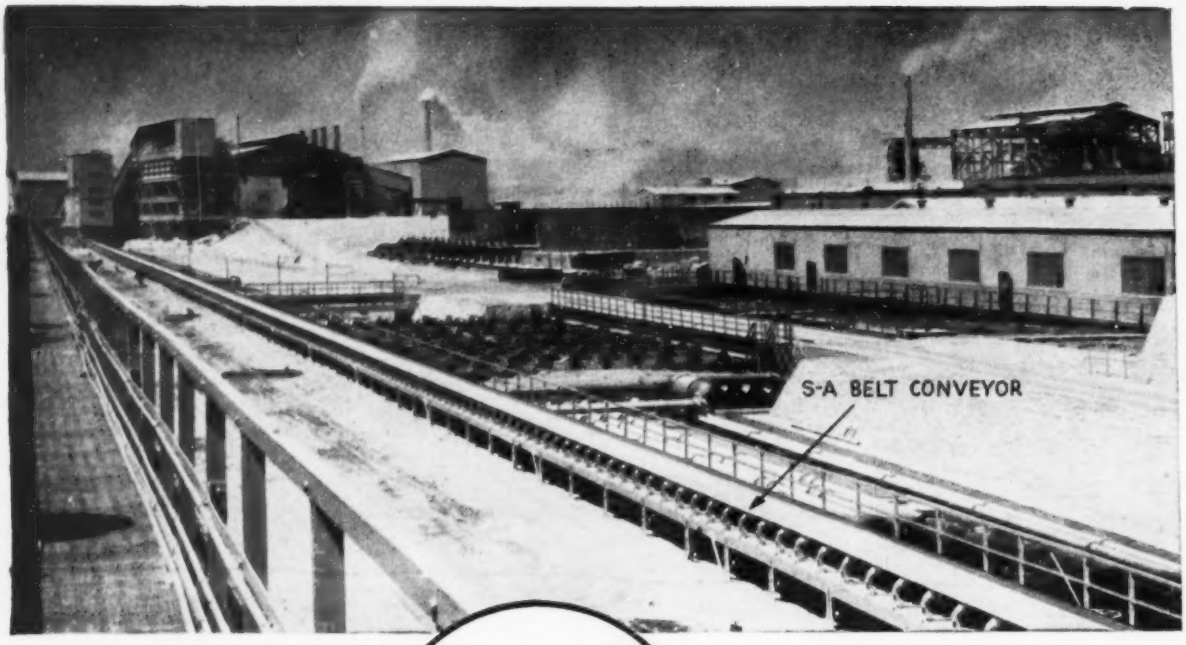
OUR 25TH YEAR OF FLOTATION ENGINEERING

MACHINE ING AND SCAVENGING!



Ask about our new Deco guarantee trial offer.

EQUIPMENT COMPANY
1400 17th Street, Denver 17, Colorado



New carriers, "exactly the same as originally furnished," were ordered by the owners when planning an extension to their conveyor system. The 60" wide conveyor, which has moved over 90 million tons of crushed and screened ore, is equipped with S-A Style No. 444 live shaft, heavy duty carriers.

S-A CONVEYING Systems

for Heavy Duty **ORE HANDLING**— **ALWAYS** at Lowest Cost per Ton

S-A bulk materials handling equipment has cut costs and provided efficient handling in scores of ore mining and processing installations. That's why, over and over again, owners have re-ordered S-A equipment for extensions and enlargements of their ore handling facilities.

During its more than 50 years in the bulk materials handling field, Stephens-Adamson has developed a complete line of equipment and an experienced engineering staff. This combination of men and equipment enables S-A to design and build conveying systems that will move your materials at the lowest cost per ton. Write for details today.

- Belt Conveyors
- Belt Trippers
- Belt, Pan & Plate Feeders
- "AMSCO" Steel Pan Feeders
- Ship Loading Boom Conveyors
- Stacking Conveyors
- Storage & Reclaiming Systems
- Flight & Chain Conveyors
- Screw Conveyors
- "Natural Frequency" Vibrating Conveyors
- REDLER Conveyor-Elevators
- ZIPPER Conveyor-Elevators
- Conveyor Belt Cleaners
- Headshaft Holdbacks
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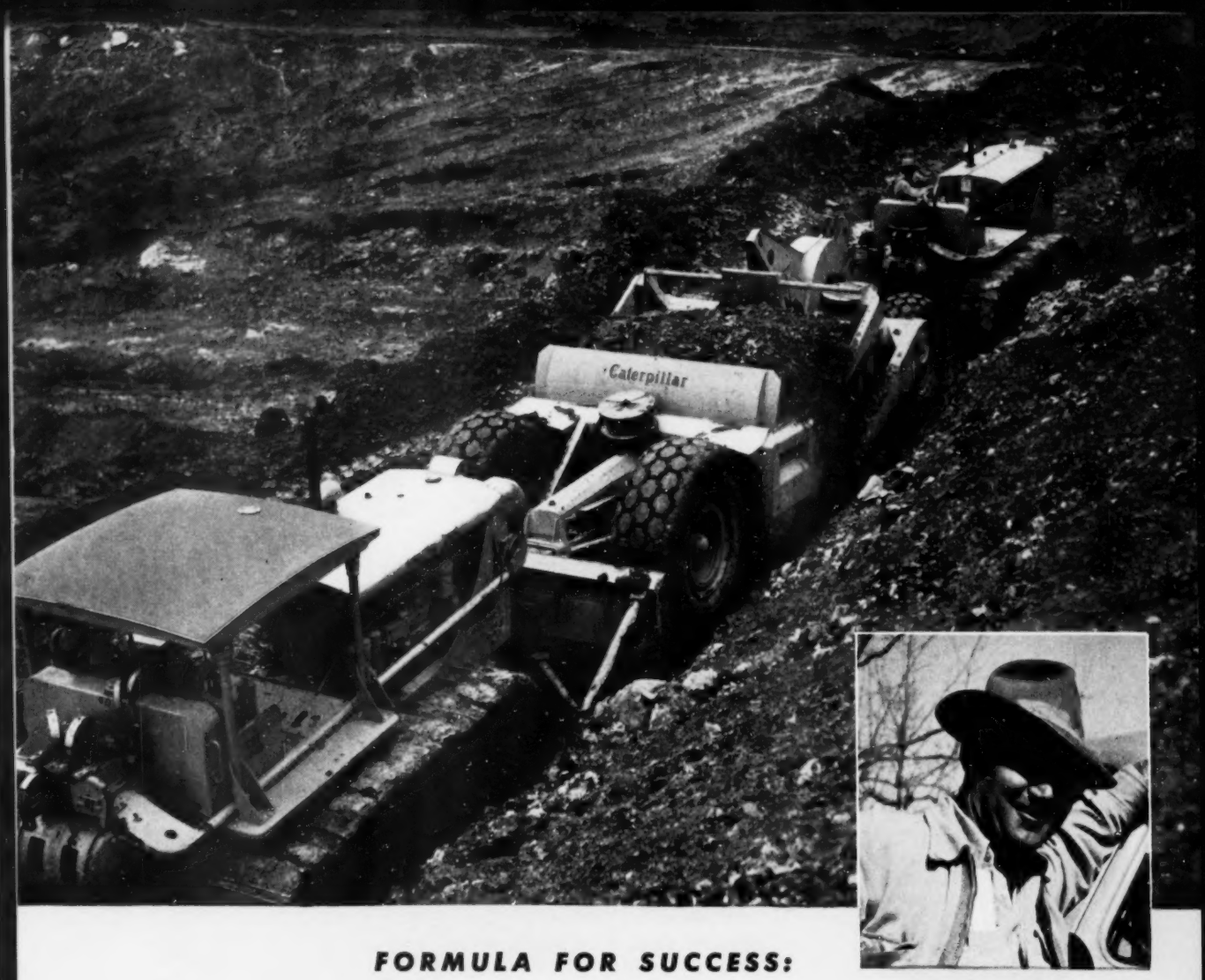
- Centrifugal Pilers
- Bin Gates & Tunnel Gates
- Car Pullers & Spotters
- Hoists & Winches
- Bucket Elevators
- Skip Hoists
- SEALMASTER Ball Bearing Units

Write for a bulletin on any of the above.

STEPHEN S-A DAMSON MFG. CO.

13 Ridgeway Avenue, Aurora, Illinois — Los Angeles, Calif., Belleville, Ontario

DESIGNERS AND MANUFACTURERS OF ALL TYPES OF BULK MATERIALS HANDLING EQUIPMENT



FORMULA FOR SUCCESS:

"Good operators and 'Caterpillar' equipment"

Rough-and-ready big yellow units and skilled operators. Omer Snyder, president of the Snyder Construction Co., Asbury, Mo., regards these as basic ingredients for success.

"I think 'Caterpillar' equipment is the best there is," he reports. "For hard rock and mud the D8 and No. 80 Scraper stand tough abuse, load large rocks, and dispose of them easily. I owe my success to good operators and 'Caterpillar' equipment."

Here's what convinced Mr. Snyder. In hauling overburden and ore from an open pit zinc and lead mine, his five D8s with Scrapers averaged 100 tons of ore an hour on an 800-foot haul. Shovel-loaded, they averaged 80 tons an hour. They carried a load of 15 pay yards per trip.

The D8s and Scrapers were doing what comes naturally. Being cable operated, the scraper can pump dead material. Its positive ejection gets rid of the load quickly and evenly. Loading and unloading fast . . . that's economy.

"Caterpillar" Diesel Tractors and Scrapers are built to last. And they'll stay that way if you insist on genuine "Caterpillar" parts and service. See your "Caterpillar" Dealer today.

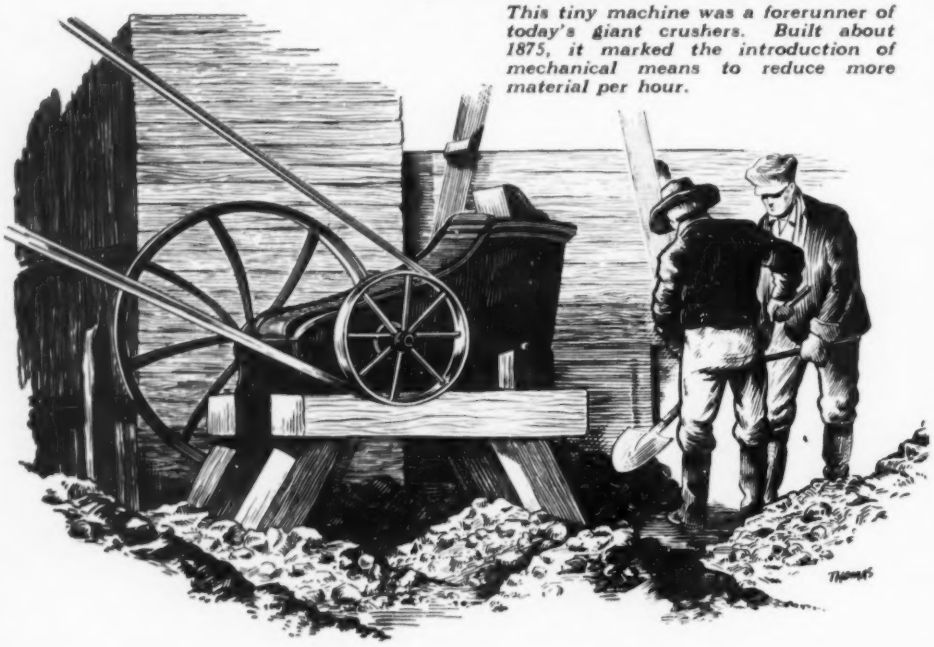
Caterpillar Tractor Co., San Leandro, Calif.; Peoria, Ill.

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

A promise of bigger things to come



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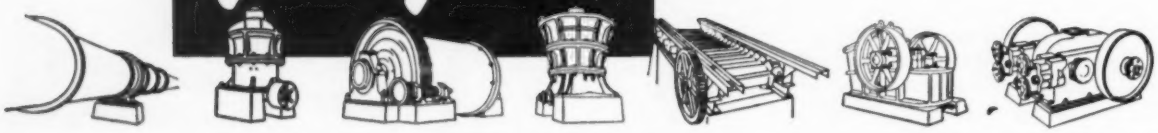

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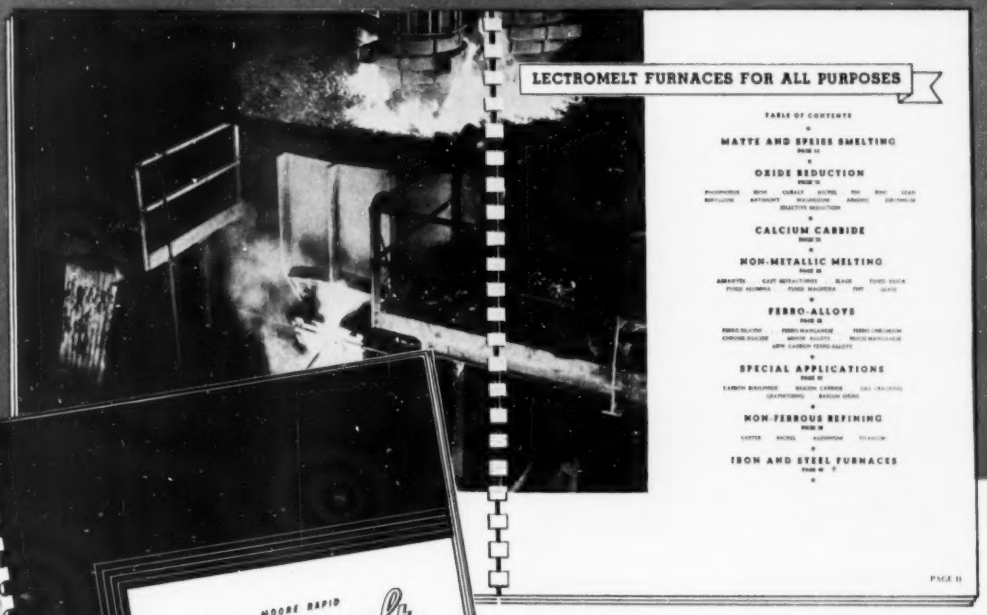

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GRAB SAMPLES From the Mail

Destroy By Debasing the Currency

Dear Sir:

Gold, like the legendary good man, can't be kept down. It arises to bedevil the managers of inconvertible paper money.

In its October Letter on Economic Conditions and Government Finance, the National City Bank of New York comments on the floundering of the International Monetary Fund.

"The Fund," notes the Bank, "has frowned on fluctuating, free (currency exchange) market rates, as a violation of its charter, seeming to prefer the fiction of stability to the reality of convertibility."

The Letter continues, ". . . people in many countries have rebelled at the corruption of paper moneys and have successfully insisted on having gold as a safe haven of purchasing power, and in some degree, as a means for accomplishing private international settlements. The Bretton Woods agreements assumed that the credit of governments could stand without the offer of gold convertibility and that governments could do the job of international financial settlements better than private bankers. Nowhere have the activities of the (International Monetary) Fund been more futile than in its effort to suppress private transactions in gold."

Lenin said that the Free World and the capitalist system could be destroyed by debasing the currency. Bretton Woods and all the theoreticians who believe that a managed currency needs no gold support play, unwittingly or otherwise, the Communist game.

John E. Kelly
Consultant in Natural Resources
Washington, D. C.

Appreciation for Article on Indian Manganese

Dear Sir:

We have carefully read the article "India Ups Manganese Production to Supply Free World Market" which was published in *Mining World* in August 1952.

The article is very complete and gives comprehensive information about the manganese industry in our country. In short, it covers all important aspects of the industry. Thus the article is very interesting and we are glad to express our great appreciation for its publication.

The Madhya Pradesh Mineral Industry Association has recently been established to coordinate the activities of the mine owners in Madhya Pradesh. The association desires to collect all information about the mining industry and to distribute it to all persons in the association. Naturally, we have pleasure in informing you of our great interest in *Mining World*.

V. C. Saptorshi
Honorary Secretary
Madhya Pradesh Mineral Industry Association
Nagpur, India

Small Miner Sees Danger in Mining Law Change

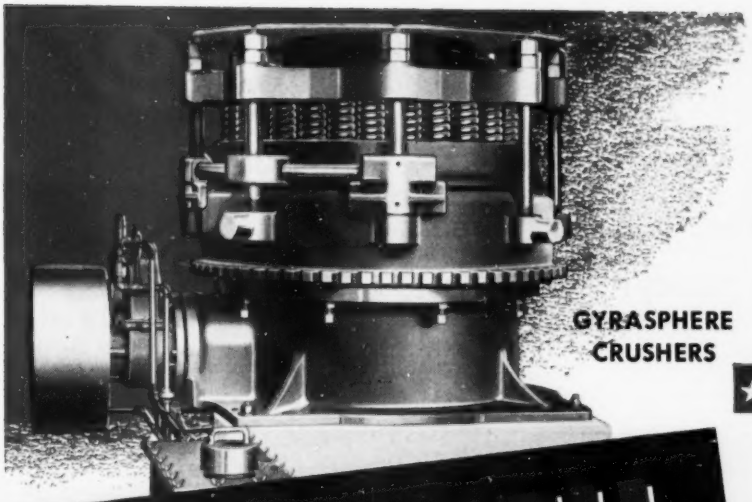
Dear Sir:

Splendid articles were published in the September *Mining World* about the Paley Report. I admire Mr. Kelly's keen perception of facts and his courage to tell the truth. There is no doubt in my mind and in the minds of others I have talked to as to the chaos, ruin, destruction, and even bloodshed that would follow if the proposed changes in the mining law made by the Paley Report ever came about.

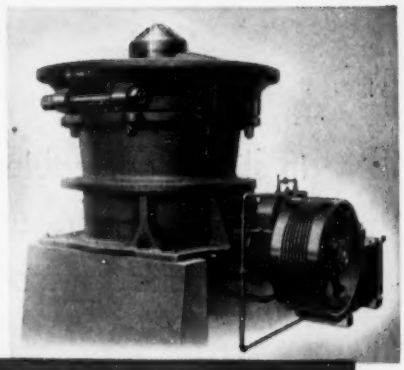
A word of introduction about myself. I am a small miner. I try to operate the Montecristo mine, 12 valid claims, in the Morongo mining district, San Bernardino County, California.

I suggest that our friend and helper, the *Mining World*, help us by publishing all the available names of United States Senators and Congressmen so that we can write to them and crush this fraud before it crushes us.

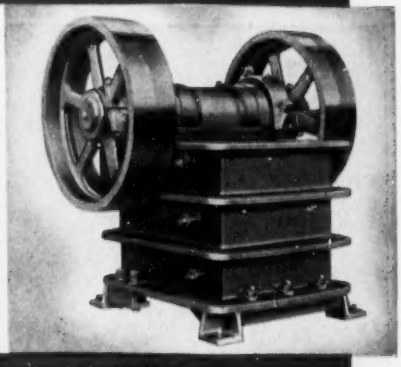
Fred A. Yoakum
Big Bear Lake, California



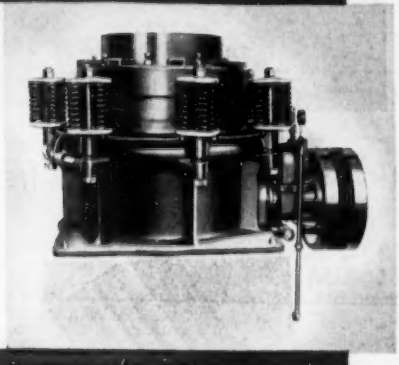
GYRASPHERE CRUSHERS



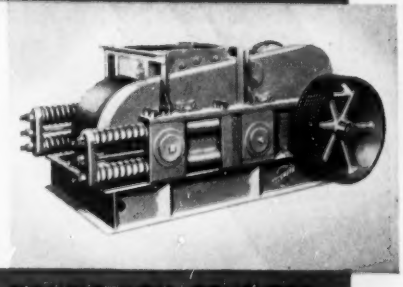
★ GYRATORY BREAKERS



★ JAW CRUSHERS



★ INTERCONE CRUSHERS



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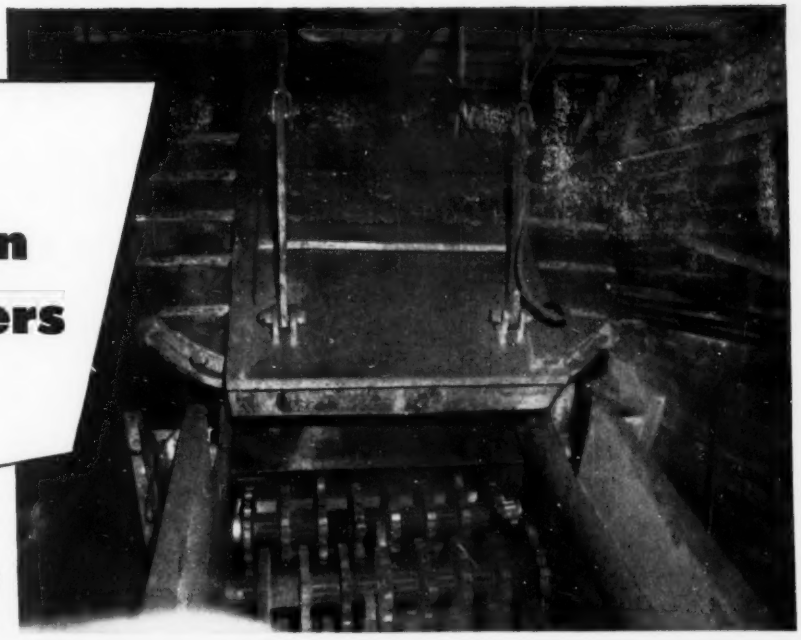

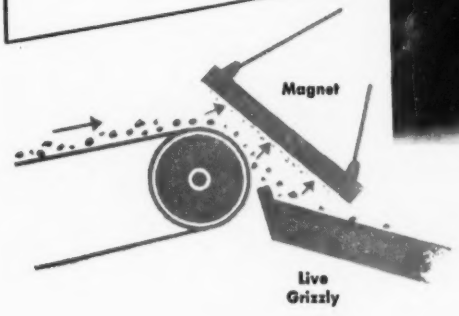

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AND—they are lighter weight, cooler operating and use less current for their strength than previous models.

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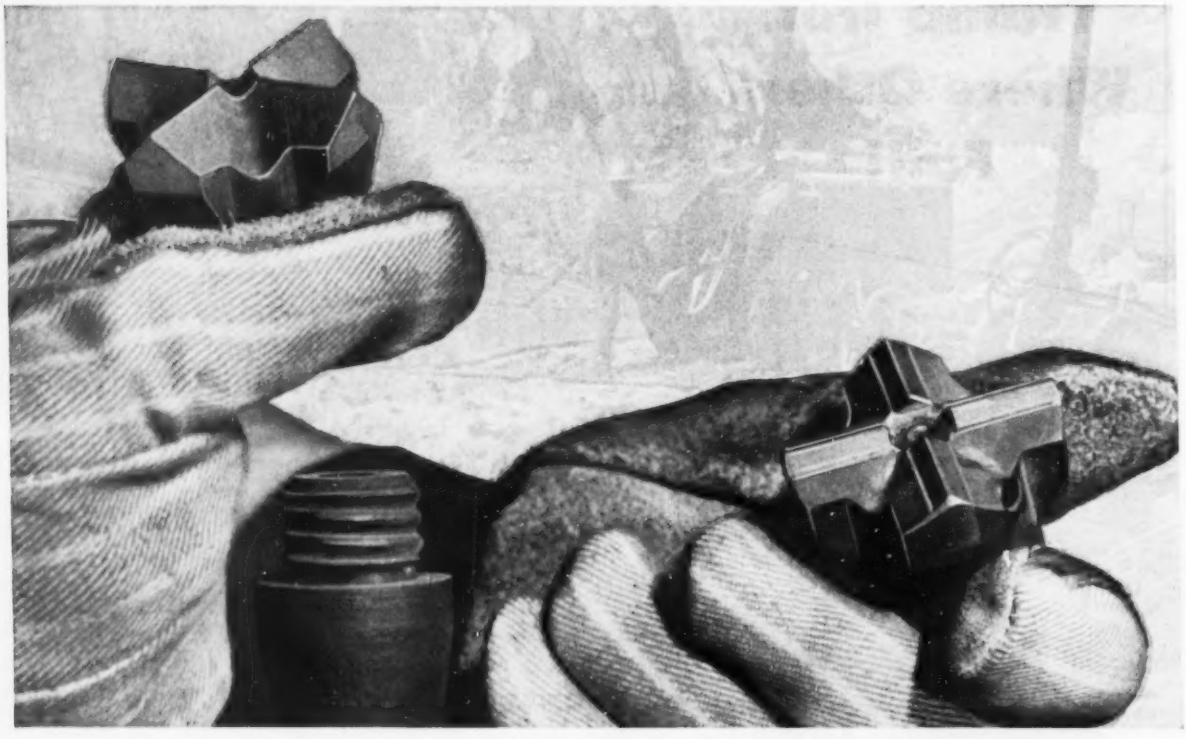

Both TIMKEN® rock bit types fit the same drill steel!

YOU can change to the most economical bit for the job as the ground changes—right on the job—if you're using Timken® interchangeable rock bits. Both Timken carbide insert and multi-use bits fit the same drill steel.

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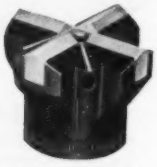
Timken threaded multi-use rock bit



Timken threaded carbide insert rock bit

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your best bet for the best bit ... for every job

GM DIESEL
CASE HISTORY No. 526-25

USER: Aurora Limestone Products Co., Aurora, Iowa, producers of road stone and agricultural lime.

INSTALLATION: GM 3-71 Diesel powers a ¾ yd. Unit shovel, replacing a ¾ yd. shovel powered by a gasoline engine.

PERFORMANCE: GM Diesel powered shovel works faster, feeding crusher about 17% more per day. Fuel consumption averages 4 gallons per hour, saving 33% on operating costs.

THIS DIESEL LOADS FASTER

and costs 1/3 less to operate

A few days after Aurora put this shovel to work, they rented a 2-cycle General Motors 6-110 Diesel for their portable crusher while the old 4-cycle Diesel was in for overhaul. Production increased from 680 tons per day to 800 tons. Fuel costs dropped from $14.00 per 10-hour day to $9.80. Needless to say, the 6-110 now powers the crusher. With power on every piston down-stroke, fast accelerating GM Diesels enable equipment to do more work economically. They're quick starting—easy to service and cost less to maintain. That's why users tell us "Any machine with GM Diesel power is a better machine." Specify GM Diesels for your equipment.

DETROIT DIESEL ENGINE DIVISION
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Write for booklet, "A $5,000,000 Horsepower Insurance Policy" that tells the whole story

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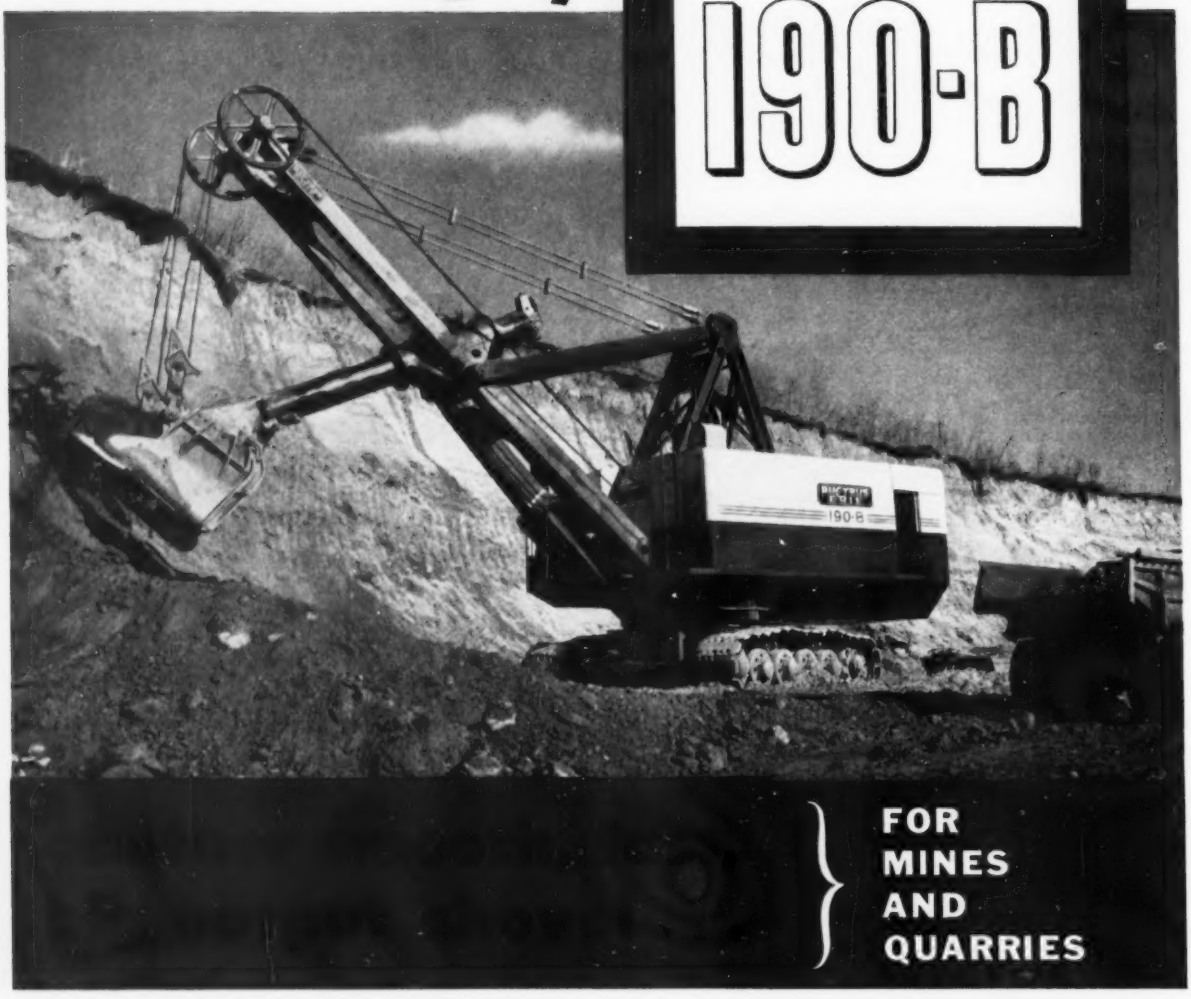
BUCYRUS ERIE

8-yard 190-B



The new 190-B follows the tradition of Bucyrus-Erie leadership in producing high quality excavators capable of delivering consistently big output at lowest possible cost per cubic yard. This 8-cubic yard shovel and dragline offers you many outstanding features — features that add up to greater capacity, higher output, and faster, smoother, more economical operation. Among these outstanding features are:

EXCLUSIVE TWO-SECTION BOOM

reduces shovel front-end weight, increases swing speed and payload capacity, yet provides ample strength for tough digging.

POWERFUL, MAIN MACHINERY

designed for double twin hoist, delivers power surely, smoothly, efficiently.

LARGER, STRONGER MOUNTING

provides ample strength for heavy duty and protective features for minimizing wear.

The 190-B has full Ward Leonard improved rotating control, is readily convertible to dragline service, and has numerous other outstanding features to meet the production demands of your toughest jobs.

209L52C

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MINING WORLD

and the export edition

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A Miller Freeman Publication

Published monthly except in April when publication is semi-monthly

DECEMBER, 1952

VOL. 14 No. 13

SAMPLE LOCATIONS

Capitol Concentrates 25
Reserve Mining Company's Taconite Program 28
International Panorama 33
Climax Molybdenum Expansion 34
South Africa's First Uranium 36
Spokane—Idaho's New Mine Hoist—by H. G. Coulson 38
Philippine Mine Crisis—by Claude Fertig 43
First Annual Southwest Minerals Conference 49
U. S. A. Metal & Mineral Prices 77

THE COVER CIRCLE: The Reserve Mining Company has rehabilitated the old Babbitt taconite plant at Babbitt, Minnesota, for experimental production at a rate of 300,000 tons of concentrate yearly; only one step in the company's overall program.

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DRIFTS AND CROSSCUTS

The New Administration and the Miner

Under the new Republican administration what can the miner rightfully expect?

Under the government of the United States the Congress establishes the mineral policy. In 1946 this policy was written into law in the "Stock Piling Act" with full purpose and intent to maintain a mining industry capable of providing adequate mineral output for national defense and essential civilian economy. The mining industry expects the new administration to carry out the provisions of this law.

The industry expects a return to basic principles and a sensible viewpoint in Washington that will entail less government interference and control. The administration must realize that not all of the undeveloped resources are in Africa, even though that continent is of great importance because of some strategic and critical minerals not found in abundance elsewhere. The primary, most important resource frontier for the bulk of the metals and minerals America requires is still in the western United States.

The promised adherence to the principle of a sound monetary system should be the basis for a return to a convertible currency based on a gold standard throughout the world. Great good can be achieved by impartial administration of long existing and time tested mining laws, and respect for orthodox monetary policies.

The law is clear on the "Buy American" section of the Stockpiling Act. The mining industry asks no more and expects no less than business-like administration of existing laws.

First Uranium From South Africa

The February 1951 issue of *Mining World* contained the first report on the planned recovery of by-product uranium at four of the largest gold mines in the Union of South Africa.

Since that time additional gold mining firms in the Transvaal and Orange Free State have started construction of nine by-product plants.

In this issue the first report on the construction, dedication, and recovery process at the first uranium plant —West Rand Consolidated Mines Ltd.—is given.

Mining World takes this opportunity to congratulate the mining industry of the Union on its remarkable achievement in building this plant in record-breaking time. The entire "free world" owes it a deep debt of gratitude for joining in the production of uranium which assures expansion of the atomic age. ..... G.O.A., Jr.

COMING CONVENTIONS

December 2, 1952. Annual meeting AMERICAN MINING CONGRESS, University Club, New York, New York.

December 5and 6, 1952. NORTHWEST MINING ASSOCIATION, annual convention, Davenport Hotel, Spokane, Washington.

February 12, 13 and 14, 1953. Mining Conclave and Convention, COLORADO MINING ASSOCIATION, Shirley Savoy Hotel, Denver, Colorado.

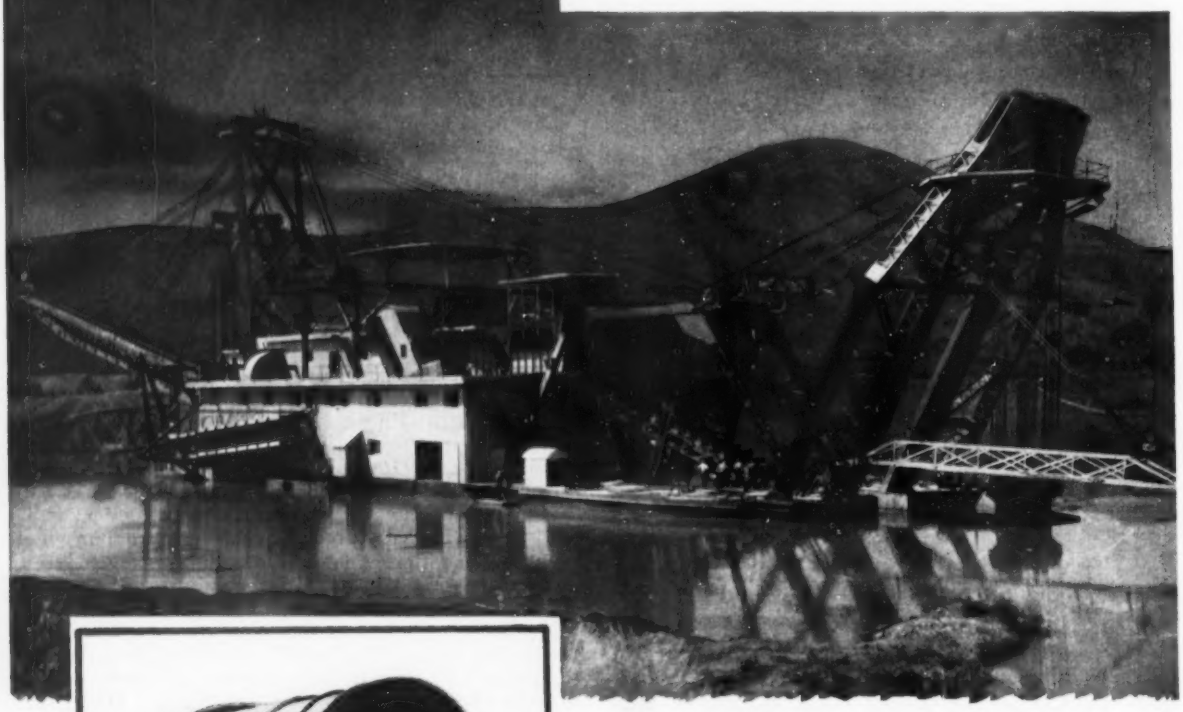
July 13 to 16, 1953. Fiftieth anniversary meeting IDAHO MINING ASSOCIATION, Sun Valley, Idaho.

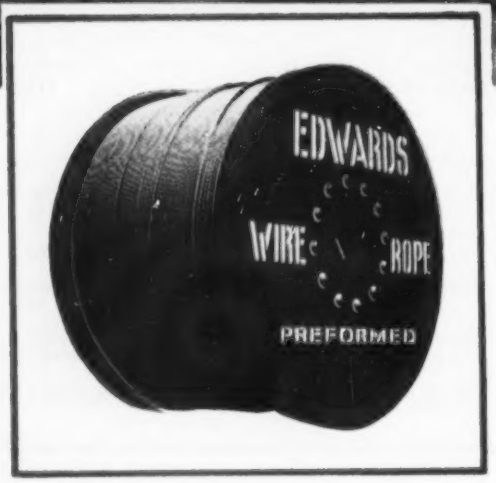
Rig for profitable dredging

with Edwards Wire Rope

To get the tough, durable wire rope required for safe, continuous operation specify Edwards Wire Rope for bow lines, guy lines, stacker lines, stern lines—for all lines used in dredging.

There's an Edwards rope in the size, grade and construction you need for every mining job, whether on dredging, shaft or open pit operation. Select the *right* rope from the complete Edwards line.





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General Office: **South San Francisco, California**

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CAPITOL CONCENTRATES

NEW COPPER PRICING ORDER UNDER STUDY IN WASHINGTON

Reports from official sources indicate that there will soon be a directive from DPA to OPS to write a tailored price regulation for domestic copper. The DMPA now has contracts with several higher cost producers to pay premium prices for their metal, but such cases are not common.

The directive, it is said, will also authorize the Defense Materials Procurement Agency to pay a premium price for copper to producers who are now selling their output at a price in excess of 24.50 cents. These suppliers are selling at ceilings established by the General Ceiling Price Regulation and are estimated by OPS to produce about 10 per cent of the domestic copper. OPS contends that 90 per cent of domestic production is being sold at 24.50 cents. The other 10 per cent, the agency says, represents for the most part high-cost copper, although at least one producer who is operating under a GCPR ceiling has a low-cost operation. OPS sources explain, however, that the output of this producer is not substantial.

OPS officials are objecting to outright decontrol of copper because, they argue, it would mean decontrol or rewriting of other regulations governing manufacturers who use copper. It would affect machinery manufacturers substantially and would present problems that price officials would not like to tackle. They estimate that decontrol would result in a market price for copper of about 31.50 cents a pound.

• *Urges Dropping Excess Profits Tax*

For some time before the election of the new Administration, there had been a growing recognition in Washington that the excess profits tax is a primary reason why venture money will not go into new enterprise or business expansion. In fact, Commerce Secretary Charles Sawyer has stated that the excess profits tax should not be renewed after it expires next June 30.

Sawyer made his statement at a news conference which he called to hear reports on what businessmen told him about the nation's business outlook during his tour of the Middle West and West.

"These business men are strongly of the opinion that taxes, and particularly the excess profits tax, make it difficult for the small businessman to accumulate the capital necessary to expand and enlarge his business," the commerce chief said. He then described the levy as one which "puts a penalty on thrift and encourages wasteful operation."

Some of the other top administration officials have questioned the advisability of continuing the excess profits tax. A few weeks ago Treasury Secretary John Snyder complained that the levy was extremely difficult to administer and said that Congress might well let the tax expire.

Metal production and expansion, especially, have been held back by the excess tax levies. Venture money will not go into risk enterprises when the government takes most of the profit—if and when a profit is made.

• *Take A Look At Canada*

Recent developments in Canada bring to mind the famous speech, made by former Bureau of Mines Director Boyd, about grubstaking activities in the Defense Minerals Administration. This program, as could be expected, turned out to be no prospector grubstaking at all. Instead it has been the DMEA matching funds exploration program. It seems that the agencies believe the prospector is obsolete.

Not so in Canada! The Canadian Provincial Government accepts prospecting applications from any experienced bona fide prospector, flies him free into the prospecting areas and provides equipment. Government plane service brings in supplies and takes out samples. Two prospectors may stake out up to 900 acres of land. Last year, over 2,000 claims were staked, and it is expected that 3,000 will be staked this year.

We do nothing to encourage primary prospecting and our entire exploration program consists of approximately 350 projects. We have not financed any development work and up to last month RFC defense money had been actually disbursed to only six mines although agreements had been signed with a handful more.

So, just take a good look at the Canadian dollar, the Canadian tax situation, and mining securities on the Canadian stock exchanges, then do a little drooling!

• *All But One*

A recent canvass of a number of large mines in the United States was made by Herbert Hoover. In every case but one, these mines reported to him that they could never have gone in business under the present tax rate and tax structure. The lone exception had struck a bonanza rich enough to defy even the tax collector.

Tax policies should encourage, not prohibit or prevent new industry. Witness the flow of venture money into Canada and the results that are being attained there. New mines and new industry are the result of the country's tax incentive program.

• *Resources Are Created*

Apropos to the discussion of the Paley commission's report and the accuracy of predictions made concerning consumption, production and conditions many years hence, Ben Hall Lambe, the well-known newspaper writer, recalled a story of what happened in his personal experience 35 years ago.

Lambe said:

"Thirty-five years ago I was attached to the Washington bureau of the Associated Press, writing business news and Sunday features. One day I read that the 1917 automobile registration, passenger cars and trucks, was 6,146,617 units, as against a 1916 registration of 4,983,340 units.

"I hied myself around to the Department of the Interior and called on the head of the U. S. Geological Survey. I told him I was seeking a Sunday feature and that I wanted his opinion as to whether discovery of new oil supplies and production of gasoline could keep pace with automobile production if the number of motor cars continued to increase at the current rate.

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" 'Young man,' said the official, 'if automobile production continues to increase at the present rate there will not be a barrel of oil left underground in the United States.'

"At the present time the U. S. Bureau of Public Roads estimates that the 1952 total passenger car, bus and truck registration in this country will total more than 53,500,000 units. And many oil wells are capped to prevent over-production."

Lambe's story is another illustration to prove that we definitely do not "exhaust" our resources; we "create" them as they are required by demand and economic conditions.

• *Critical Need for Ferro-Alloys*

A new government program for boosting the production of critically needed ferro-alloy materials has been announced by Defense Mobilizer Henry H. Fowler. While the materials were not specifically identified, but referred to as "certain strategic materials specified as Band I," it is believed they include nickel, cobalt, tungsten, beryl, columbium and tantalum—all needed for the jet aircraft program.

Fowler's order instructed DMPA to initiate such extraordinary measures as may be needed to expand supply. Among the suggested methods were loans and advances, grants of funds for exploration and technological development, long-term contracts with market guarantees, over-market prices, bonus payments for accelerated delivery, and negotiations with foreign governments.

Special instructions were contained in the order for DPA, the Munitions Board, the Mutual Security Agency, and other government agencies.

• *Decision On Development Fund Reported Near*

Washington rumor has it that DMPA finally has approval from DPA and the Budget Bureau to segregate $5 million for a development program to fill in between the exploration program and the production expansion program. Some 12 months have been consumed in talking about doing this and in deciding whether the orphan should be adopted by DMEA or DMPA.

It is understood that the program will be modeled after the old RFC development plan, but with this important difference—more than likely matching funds will be demanded of the operator. This, if true, means that the effectiveness of such a plan will be reduced materially. If and when the new plan is announced, operators had better make their applications promptly, both because the fund is limited and because Administrator Larson predicts the end of DMPA before too long.

• *Tungsten Shippers Protest Payment Delays*

Small tungsten shippers are feeling the lagi n the government's payments for their concentrates. Settlements sometimes are delayed 60 days or more.

Much the same situation occurred in Metals Reserve premium payments early in World War II when the small operator often found himself with cars on the road and no money to pay his labor. The difficulty was straightened out eventually by setting up a revolving fund from which 80 per cent of the premiums were paid on delivery of the ore to the smelter and the balance settled later. In the case of advance payments by GSA, no revolving fund would be necessary. Some GSA contracts are already worked out on an 80 per cent advance payment basis and there seems to be no good reason why the same plan cannot be set up for tungsten and for the new manganese purchase program.

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Heavy-Media Separation?
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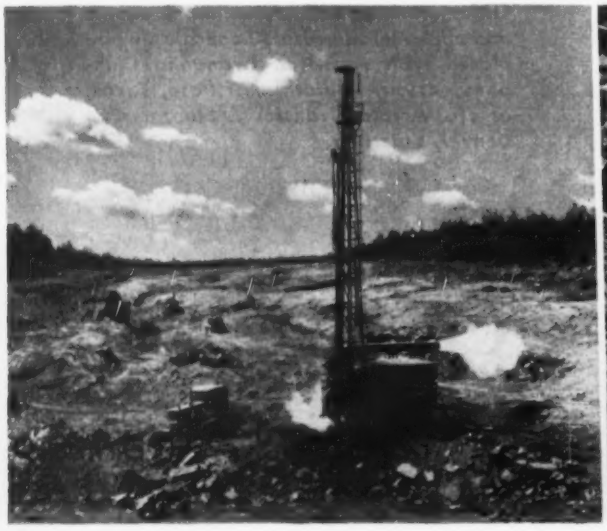
Reserve Mining Company, prompted by the recent solution of problems that defeated the original operators, has reactivated the old Babbitt taconite beneficiating plant in Minnesota by the addition of new equipment and some minor structures.

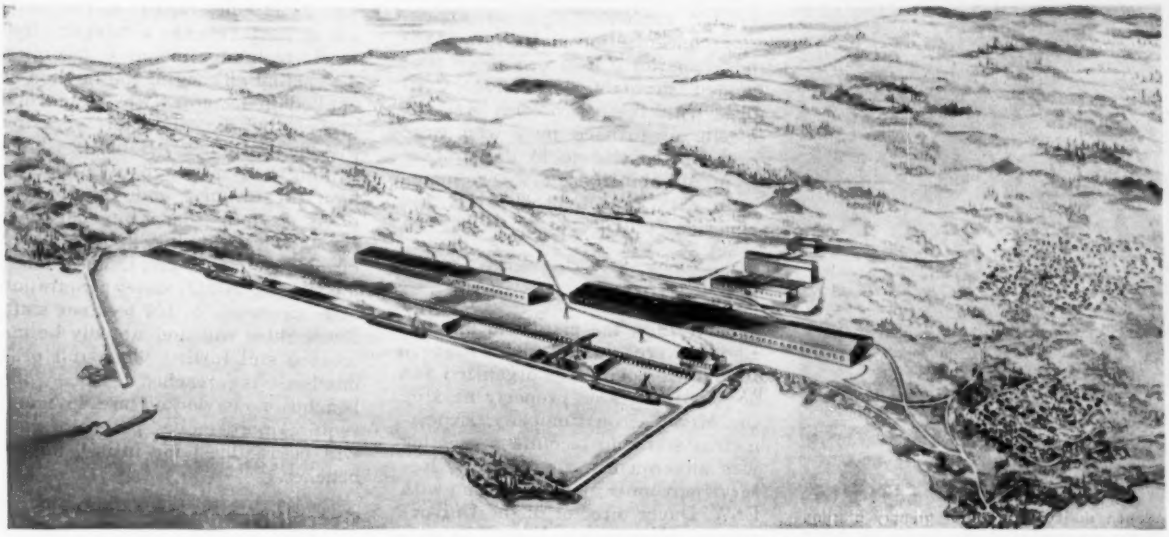
Reserve Mining Company's

Since Peter Mitchell sank the first test pit in Mesabi taconite near Babbitt, Minnesota in 1871, progress toward the utilization of taconite as a commercial source of iron has been slow and expensive. With the single exception of D. C. Jackling's attempt to recover a commercial product in the early 1920's, taconite has, until recently, been a laboratory "ore" of little or no economic value. Gutting of the great Mesabi's direct shipping ores during World War II, however, left low-grade material as the most obvious domestic source of supply for the increasing requirements of domestic iron and steel furnaces.

Wash ores, now responsible for increasingly important percentages of production, are not the answer to future supply problems because of the minor amounts of these ores available. Ferruginous cherts, however, are abundant on all of the major iron ranges. With these cherts—especially the Minnesota taconites and the Michigan jaspars —the problems are still largely those that defeated Jackling. First,

LEFT: Construction of a permanent oxygen plant to supply the requirements of jet piercing was completed recently by Linde Air Products Company. The pipe in the foreground feeds a service line parallel to the mining area. RIGHT: Material removed from the plant site is used to build the system of breakwaters that will form the harbor and turning basin of the Lakeside Project.





Reserve's future program of construction will result in a townsite, railroad, harbor, and 10,000,000-ton taconite concentrator on the Minnesota shores of Lake Superior north of Duluth. Already well underway, the program is based on the successful results of years of research and plant operation.

Taconite Program Underway

the rocks are of such a hardness that drilling by ordinary methods, though not impossible, is slow and prohibitively expensive. Second, beneficiation is required to boost the iron content to a usable grade. Third, the value of the concentrated material is but slightly greater than that of direct shipping ores, putting the two in competition on the market.

The first of these problems has been solved by the introduction of jet piercing. The second—concentration—is being solved in laboratories and pilot plants. Recent price increases and the decrease in the prominence of direct shipping ores makes the third of diminishing importance.

Of the taconite programs that are now underway, Reserve Mining Company's is probably the most ambitious effort and is an excellent example of the problems met in pioneering taconite mining and beneficiation.

The Mesabi Iron Company, organ-

LEFT: Construction of a permanent oxygen plant to supply the requirements of jet piercing was completed recently by Linde Air Products Company. The pipe in the foreground feeds a service line parallel to the mining area. RIGHT: Material removed from the plant site is used to build the system of breakwaters that will form the harbor and turning basin of the Lakeside Project.

Wagon drills are used for primary blasting in the preparation of the site for the future plant near Lake Superior. Minnesota's famous North Shore Drive from Duluth was rerouted to provide room for the projected concentrator.

ized in 1919 by D. C. Jackling of Utah Copper fame, built the first plant designed to concentrate taconite near Babbitt, Minnesota, on the east end of the Mesabi iron range. Iron content of the eastern Mesabi taconites, unlike those farther west, occurs for the most part in magnetite rather than hematite. Because such a mineral lends itself to the relatively simple methods of magnetic concentration, these eastern taconites have received the bulk of interest in concentration. Mesabi Iron closed its plant in 1924 during the post-Warld War I depression after only two years of operation. High drilling costs, expensive concentration and a low ($1.87 per long ton) iron ore price prevented profitable operation. Coupled with these problems was the inertia of furnace men who were reluctant to change to the product from Mesabi Iron's plant, a material with which they had no experience.

Reserve History

After 1924, the plant and mine at Babbitt were idle. In 1939 the Reserve Mining Company was organized and acquired leases on property held by the Mesabi Iron Company. Experimental work on taconite processing was subsequently carried on by Reserve personnel in collaboration with E. W. Davis, director of the University of Minnesota's Mines Experiment Station in Minneapolis. Among other taconite developments, Reserve's present method of concentrate agglomeration by pelletizing was developed by Davis and his staff. The outlook for taconite processing was further enhanced in 1941 when Minnesota's state legislature passed the taconite tax law limiting the ad valorem tax which could be assessed against taconite lands and processing plants.

Though World War II delayed developments, shortly after the war Linde Air Products Company, a subsidiary of Union Carbide and Carbon Corporation, developed an entirely new system of rock penetration—jet piercing. (See MINING WORLD, June 1952.) The method as finally evolved could be used to sink blast holes rapidly in the hardest of acidic rocks—a category that most certainly includes taconites. The actual efficacy of the method as applied to taconites was tested and proven by experimental work on the deposits near Babbitt. Churn drilling had made about a foot an hour in taconite and required as many as four sharp bits per foot. Present jet piercing figures, based on production from Linde's latest model, the JPM3, show penetration rates in excess of 100 feet per shift. These rates will undoubtedly be increased still further when full production is reached, since the benches now worked are low and require more moves per shift than will be required for future, higher benches.

Since the breakwaters are too narrow for maneuvering the 22-ton trucks used in their construction, turn-tables have been installed, enabling the trucks to turn and back a short distance to the dumping point.

Overall Planning

With processing methods perfected on a laboratory scale and the successful application of jet-piercing to taconites a reality, cost estimates indicated that full scale taconite mining and processing would prove profitable. Reserve, now owned jointly by Armco Steel Corporation and Republic Steel Corporation, formulated plans to mine and beneficiate at Mesabi Iron's old Babbitt plant on an experimental basis at a rate of 300,000 tons of concentrate yearly. The overall program included (1) the installation of new machinery and equipment in the existing Babbitt plant, (2) development of the mine at Babbitt, (3) construction of a 47-mile railroad from Babbitt to Lake Superior, (4) construction of a harbor on Lake Superior near Beaver Bay, (5) preparation of a site for a future plant with a capacity of 10,000,000 tons of concentrates annually, to be constructed when metallurgical and mining methods have been further perfected, and (6) the construction of two townsites—one at Babbitt and one at the harbor.

To implement this program, permits were received from the Minnesota Conservation Commission to use Lake Superior water for processing and from the United States Government to build a harbor near Beaver Bay.

After successfully testing on a semi-commercial scale the agglomeration method in a pilot plant at Armco's Ashland, Kentucky division, pellets were used in varying percentages in the blast furnace burden in Armco's Sixth Street furnace in Ashland.

The results of these tests proved the adaptability of pellets as a blast furnace charge and three separate

construction contracts were let—reconstruction of the Babbit plant to McGraw Construction Company of Middletown, Ohio; housing at the two townsites to J. D. Harrold Company of Duluth, Minnesota; and railroad and future plant site preparation (known as the Lakeside Project) to Hunkin-Arundel-Dixon, a combination for this work of Hunkin-Conkey Construction Company of Cleveland, Arunel Corporation of Baltimore, and L. E. Dixon Company of San Gabriel, California.

The orebody to be worked by Reserve has an estimated proven reserve of 1,500,000,000 tons with what appears to be an equal unproven reserve. At a concentration ratio of 3 to 1 and a production rate of 10,000,000 annual tons of concentrates, the proven reserve alone indicates a life of 50 years for the property. Taconite in this area takes the form of a ferruginous chert in which iron minerals, with magnetite the most important and most abundant, are extremely finely divided and disseminated and firmly cemented by cherty silica. The rock is dense and dark gray with the individual mineral particles seldom megascopic, giving a nearly homogeneous appearance.

The section of the Reserve orebody delineated by drilling indicates an orebody about 9 miles long, 2,800 feet wide, and 175 feet deep at the thick edge of the wedge-shaped vertical cross section. Present stripping has uncovered an area roughly 1¼ miles by 500 feet.

Mine Preparation

Overburden, in the form of glacial till, on the ore that Reserve is now mining varied in thickness from two to eight feet. Because jet piercing has little or no ability to penetrate loose alluvium, ore must be stripped clean where the blast holes are to be collared, somewhat difficult due to the many saw-toothed ridges forming the ore surface. These ridges are now being mined from one end of the orebody by low (20 to 30 feet) benches so that the mining surface in the future will be flat for maximum production. Blast holes are drilled on 16- to 18-foot centers in three rows 18 to 20 feet apart and parallel to the face. The first row is kept well back of the overbreak to reduce the possibility of losing flame effect in cracks and fissures. In the blast, the first hole to fire is the center hole in the first row. The two adjacent holes in this row and the center hole in the second row, followed by the adjacent holes in the first and second rows and the center hole in the third row, when blasted, form a vertical v-cut in the face of the bench to which adjacent holes blast. This method gives two additional free faces during the blast but still leaves a straight bench where desired. Millisecond delays fire the primacord leading to the Nitromex cans and loose powder with which the holes are loaded.

Broken material is loaded into 22- and 34-ton Euclid trucks by Marion 151-M shovels carrying 5-yard dippers. The small dipper (these same shovels will later mount 7½-yard dippers) is being used to prevent the loading of material that is too large to be handled in the present primary crusher at the Babbitt plant.

Loaded taconite is carried over 1½ miles of near-perfect macadam haul road to the plant site. This road was laid with a base course of minus 6-inch rock followed by layers of successively smaller material and surfaced with minus ¾-inch aggregate carrying enough fines for compaction and binding. The resulting surface is constantly maintained and shows no sign of failure. Nor does the subsurface, though heavy equipment (shovels, tractors, etc.) traverse it regularly.

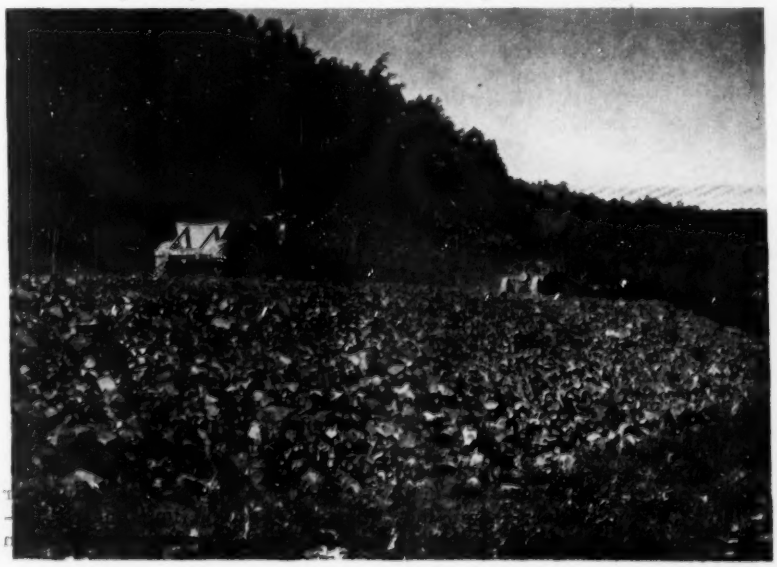
Babbitt Plant Operation

Equipment installation in the old Babbitt plant has been completed and the plant is now in shakedown for full operation in the spring of 1953. Though the plant is housed mainly in the old Babbitt buildings, some new structures were required for crushing machinery and temporary storage. Because of the great interest the operation generated, causing a plethora of visitors, and because initial operation in any new plant requires the concentrated effort of its staff, the company has been required to close the Babbitt beneficiator to inspection until full and stable production is reached.

Though no exact flowsheet is available as yet, the processing includes (1) primary and secondary crushing, separated and followed by temporary storage, (2) grinding (by

One-third of the water required at the present Babbitt concentrator is carried two miles from Birch Lake through this 20-inch pipe. The rest of the supply is furnished by reclaiming water from the plant.

The roadbed of the railway that will carry crushed ore from Babbitt to Lake Superior has no grades against the load nor sharp curves along its 47-mile length.



The first of the three breakwaters that will form the harbor at Reserve's plant is shown during construction. This breakwater is now nearly finished and the second, which will lead from the shore to a point near the island in the middle background, has been started.

rod mills) and classification, (3) magnetic cobbing, (4) ball-mill grinding and classification of the cobbed product, (5) hydroseparation and further magnetic separation, (6) filtering and finally (7) agglomeration, a process wherein balls of the partially dewatered concentrate are formed in a revolving drum and furnace-hardened.

The Babbitt plant is not a pilot plant because its operation will probably continue even after the completion of the larger plant near Lake Superior. Rather, it is an experimental operation to formulate exact processing methods on which to base the final design of the larger plant.

Considered design is apparent in every phase of Reserve's gigantic project. Townsites, for instance, were planned by Pace Associates of Chicago in conjunction with the University of Minnesota School of Architecture. The Babbitt townsite, designed to house 5,500 workers and their families at the mine and Babbitt plant, now has forty-five completed dwellings, a general store, post office, doctor's quarters, service station, temporary grade school, and water, sewage, electrical, and telephone systems. Though lots have been sodded, landscaping is not yet complete.

Two major utility installations service the requirements of present operations at Babbitt. Water is required at a rate of 50 tons per ton of concentrate. One third of this is pumped from Birch Lake, two miles north of Babbitt, through a 20-inch Naylor welded pipeline to a reservoir at the plant site. The other two-thirds of requirements are met by reclaiming water from the beneficiator.

The second major installation supplies oxygen for jet piercing in the mine. Linde Air Products has installed a central plant near the orebody. A 6-inch pipeline feeds oxygen from the plant to a 4-inch line parallel to the long axis of the mining area. From this second line, 2-inch hose leads to the jet-piercing machine.

The Lakeside Project

On the larger Lakeside Project the railroad, the townsite, the plant site and the harbor are now under construction.

Grades on the railroad, favoring the load, reach a maximum of about 3 percent. No grades against the load will be necessary. Probably the most important construction problem met so far on the railroad has been the stabilization of muskeg. Piling has been driven in these areas before ballast placement and no subsidence is evident, though heavy equipment has operated over these areas. The finished rail line will have 140-pound rails laid on creosoted ties and Diesel-electric locomotives will pull trains made up of 80 to 90 cars, each with a pay load of 90 to 100 tons.

Though the steel strike this past summer delayed rail delivery, a 20-mile section from Lake Superior to a junction of the Duluth Mesabi and Iron Range Railroad is being readied to supply materials and equipment for the Lakeside project. The remaining 27-mile section will be constructed when the Lakeside plant nears completion.

The townsite at Lake Superior has 46 dwelling units nearly finished, two of which have been equipped for temporary use this year as a primary school, awaiting completion of permanent school facilities. Over 1,500 families will eventually occupy the townsite homes, built in a natural amphitheater overlooking the lake.

Near the permanent town, the prime contractor for the Lakeside project has built dormitories, a mess hall, power plant, and water and sewage systems for temporary use during the construction period. Since the entire program will last for some years hence, the buildings and installations have been built with the attention and planning usually reserved for permanent construction. For instance, such refinements as spun glass insulation is standard in most buildings, including the temporary power plant.

Before the site for the permanent concentrator was prepared, the main highway from Duluth, Minnesota was rerouted to make room for the entire 10,000,000-ton plant.

Construction schedules call for completion by late 1955 of the first of the four 2,500,000-ton units comprising the finished plant. When this unit is in operation, a ½-unit section (1,250,000 annual tons of concentrate) will be added. Production from this addition should be realized in 1957. At this point, total expenditures by Reserve will have reached $160,000,000. The remaining units necessary to bring the plant to a rated capacity of 10,000,000 tons of concentrate will be added as required.

At present, the site for the entire plant is being prepared so that no excavation will remain to interrupt or impede future construction and operation. Rock being excavated is used to form the breakwaters required for the harbor.

To summarize, the Babbitt project, a completely integrated operation under the direct supervision of Reserve personnel, includes (1) present mining operations, (2) the reactivated Babbitt plant, and (3) the Babbitt townsite.

The second division of Reserve's program is the Lakeside project—preparation for future large-scale production. When completed, it will include (1) mining at Babbitt at a rate of about 30,000,000 tons yearly, (2) a large crushing plant at Babbitt for primary diminution of ore, (3) a 47-mile railway from Babbitt to Lake Superior, (4) a concentrator at Lake Superior capable of producing 10,000,000 tons of concentrate annually, (5) a harbor on Lake Superior, and (6) a townsite to house employees working at or near the main plant.

INTERNATIONAL PANORAMA

SALT LAKE CITY, UTAH—The Vitro Chemical Company will increase the capacity of its uranium mill here from 165 to 350 tons per day. The mill treating autunite and asphaltitic uranium ores is the largest non carnotite type uranium plant in the United States.

NEW YORK—Production of 9,034,000 net short tons of steel in September in the United States was a new high for a 30-day month.

BOGOTA, COLOMBIA—The Johns-Manville Corporation is a partner in the newly formed company, Asbestos Colombianos, S. A., which will develop asbestos deposits in the Department of Antioquia.

MONTREAL—Fort Chimo Mines controlled by Frobisher, Ltd. has discovered iron ore in the northern part of its 500-square mile concession in northern Laborador.

TRAIL RIDGE, FLORIDA—Humphreys Gold Corporation has started shipments of byproduct staurolite from its beach sand illmenite plant to portland cement plants.

WASHINGTON—The Office of Defense Mobilization has directed that all government agencies make every effort to reduce consumption, and increase production of nickel, tungsten, cobalt, beryllium, tantalum, and columbite.

CUSTER, S. DAKOTA—GSA has opened a small lot purchase depot here for beryl containing more than 8.0 percent BeO. Base price is $40.00 per unit. Similar depots will be opened at Franklin, New Hampshire, and Spruce Pine, New Hampshire.

JEFFERSON CITY, TENNESSEE—The Tennessee Coal & Iron Division of United States Steel company is doubling production of zinc ore to 2,200 tons per day at its mine here.

TORONTO—Milnet Mines, Ltd., and Falconbridge Nickel Mines, Ltd. are joining to produce 4,104,000 pounds of nickel in the next two years for sale to DMPA. Milnet will mine the ore at Sudbury and Falconbridge will process it. DMPA has advanced $440,000 to Milnet to assure production of 300 tons of ore per day by March 1, 1953.

WASHINGTON—The DPA has raised its United States titanium production goal for 1955 from 12,000 to 22,000 annual short tons. Production in 1951 was only about 500 short tons.

MANILA—Atok-Big Wedge Mining Company, one of the Philippine's largest gold mines has closed. The government imposed minimum wage law makes mining operations unprofitable.

BAGDAD, ARIZONA—The Bagdad Copper Corporation will install a new electrolytic refining plant here as part of a program to increase copper output to 35,000,000 pounds yearly from the present 20,000,000. DMPA will buy up to 27,000,000 pounds of copper for eight years at a 24.5 cent per pound floor price.

STOCKHOLM—The Hakansboda zinc-cobalt in northern Sweden is being reopened by Stora Kopparbergs Bergslags.

VANCOUVER—Iron ore exports from British Columbia in 1952 will exceed 900,000 short tons, compared to 113,585 in 1951.

LOS ANGELES—DMPA has awarded a contract to the Southwestern Engineering Company to develop methods of extracting manganese from low grade ores.

WASHINGTON—An increase in the supply of selenium to 1,100,000 pounds in 1955 has been set by the DPA. Total supply in 1950 was 850,000 pounds.

OSLO—A promising deposit of columbite ore has been discovered at Sove in Telemark. A pilot plant is being erected to process 100 metric tons of ore per day.

MEXICO CITY—Pan American Sulphur Company has completed plans for the construction of a Frasch process sulphur mining unit at Jaltipan, Vera Cruz State. First production will be in August 1954. Projected capacity is from 300,000 to 600,000 long tons annually.

OSLO—Sydvaranger A/S will ship about 500,000 metric tons of iron concentrate from its rebuilt plant at Kirkenes during 1952. The United Kingdom and Western Germany are the destinations for most shipments.

AUSTRALIA—The country's third largest copper producer, New Occidental Gold Mines of Cobar, New South Wales, has closed down because of high operating costs.

WASHINGTON, D. C.—The Defense Production Administration has arranged to "borrow" 44,000,000 pounds of aluminum fom Great Britain to stave off part of the loss of aluminum production in this country caused by the hydroelectric power shortages in the Pacific Northwest and in the Tennessee Valley.

MIDLAND, PENNSYLVANIA—Rem-Cru Titanium, Inc. is installing new melting facilities to double its ingot capacity by the end of the year. Ingot sizes will be raised from 1,200 pounds to from 2,000 to 4,000 pounds each.

OTTAWA—Canada's production of zinc in 1952 should be about 360,000 short tons—an all-time high and 55,000 tons above the World War II record year of 1943.

PARIS—Recent price drops in zinc and lead may force French, Tunisian, and French Moroccan zinc-lead mines to suspend operations.

WASHINGTON—DPA has established a 1954 goal for rutile production at 25,000 short tons. This is an increase of 6,000 tons over 1951 output.

House Committee Reports Domestic Mineral Buying

The House Committee of the United States Congress on Interior and Insular Affairs has just released a report on the status of domestic mineral-purchase programs as of September 29, 1952.

The report shows that 50,884 short ton units of tungsten have been purchased; 10,181 tons of manganese ore accepted, with Deming, New Mexico receiving 7,640 tons, and Butte, Montana, 2,120. Grants Pass, Oregon purchases of chrome ore and concentrates totaled 13,278 tons. The mica purchase depots at Spruce Pine, North Carolina; Custer, South Dakota; and Franklin, New Hampshire have purchased a total of 20,852 pounds of block mica, and 16,441 pounds of hand-cobbed mica.

The mica buying stations are now purchasing "half trimmed" mica at prices from $2.00 per pound for No. 5½ and No. 6, heavy stained, to $12.00 per pound for No. 3 and larger, stained.

African Labor Unrest Complicates Financing

Political troubles in Kenya and South Africa, coupled with the strike in the Rhodesian copper mines, apparently are making it more difficult for mining companies in many parts of Africa to raise the capital needed for future development.

These troubles, primarily a struggle between the white and colored peoples, have caused a drop in the stock markets, which is not in keeping with the excellent profit figures published by the Rhodesian companies and the development reports of the South African gold mining houses.

The copper strike in the Rhodesias is not a simple demand for higher pay, which the companies state they would be more than glad to give. Rather, it is the culmination of a struggle between native and European workers over the claim that native workers have access only to the unskilled menial jobs.

An exception to this situation is found on the Gold Coast, where Africans reportedly are trained for responsible jobs. The Ashanti Goldfields Corporation is a case in point. F. J. Erroll, a member of the British Parliament and a director of Ashanti, reports that he found much cooperation between the Gold Coast Chamber of Mines and the African Union of Mineworkers. He states that the mining industry is committed to a policy of full and close cooperation with the Africans. This represents a substantial advance from the previous cautious position of the Ashanti group, which is undertaking an extensive house and town building program for the workers and is considering more mechanization for the mines.

Climax's new Storke level crushing building is just east of the Continental Divide at the headwaters of the Arkansas River. Storke level is 300 feet below the main Phillipson level.

Ore trains from the Storke level will enter the crushing plant over the fill in the left foreground. Crushed ore will emerge on a belt conveyor from the port at the lower left.

CLIMAX MOLYBDENUM EXPANSION

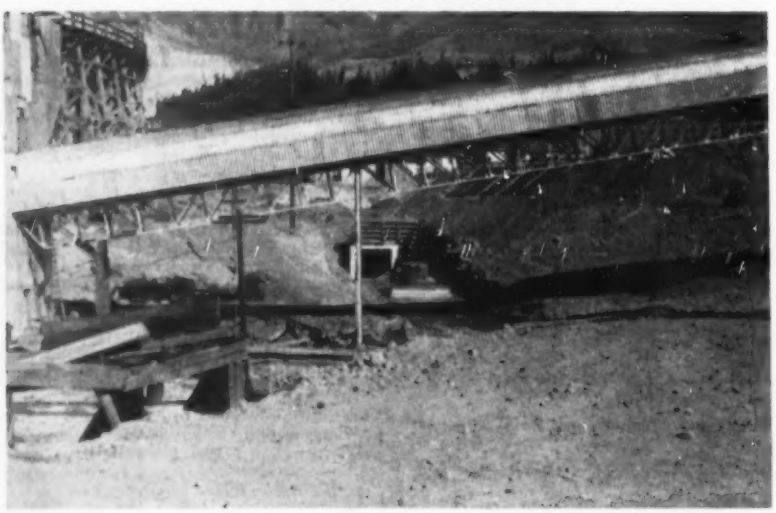
First ore from the low-level Storke development and completion of the 5,000-ton-per-day flotation mill addition set for early 1953

The large expansion program of the Climax Molybdenum Company at its Climax mine in Lake County, Colorado, is fairly well on schedule. First mining of ore from the new Storke level and its treatment in the new 5,000-ton-per-day mill addition are scheduled for early in 1953. Under a government contract, Climax is scheduled to produce at maximum capacity through 1955.

During 1951 when the mill was operated almost to capacity, Climax mined and milled 4,566,548 tons of ore, produced 22,538,739 pounds of molybdenum (contained in concentrate), and 259,000 pounds of tungsten, as well as substantial amounts of cassiterite and pyrite.

Recent ore production from the Phillipson level, long the mine's main production level, has been 16,000 to 18,000 tons per day. Approximately 1,000 tons of this was mined from the open pit, trucked to ore passes, and dropped to the Phillipson level for tramming to the mill.

A bulldozer levels the site of the new ore bin. The conveyor in the foreground extends from the fine crushing plant, left, to the new mill.



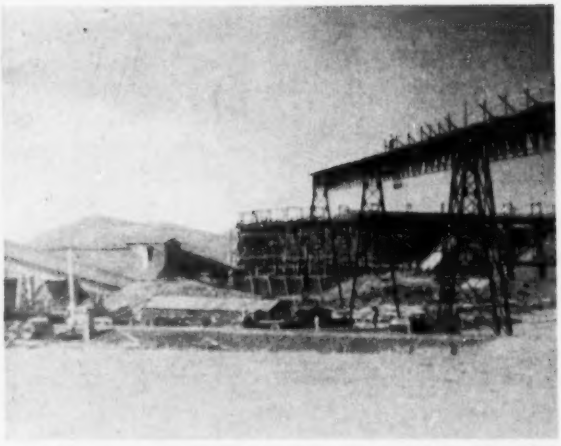
Phillipson Level Developments

Experience has proven the value of concrete slusher drifts and draw points. Approximately 1,000 cubic yards of concrete are placed per month. Portable steel forms speed pouring. No reinforcing steel is used and when a draw point wears out, its finger is "hung," a concrete plug poured, the draw point reconcreted to its original size, and the "plug" blasted out so that the draw can be resumed. Experiments are continuing for the best design for the box-hole loading points.

A new type of slusher hoist is being used; it has tandem drums driven by a chain drive from the electric motor, with one drum ahead and under the second drum. The older slushers were double drum, with the drums placed side by side. This necessitated cutting of an extra-wide station in the slusher drift in which to set the hoist.

Under the recent agreement with the DMPA, Climax will mine 17,000,000 tons of lower-than-average-grade ore above the Phillipson. Much of this ore is in blocks adjacent to those already caved, so that

Route of the conveyor from the Storke level to the mill near the portal of the 300-foot-higher Phillipson level is shown in this picture. The arrow points to the new 5,000-ton-per-day grinding and bulk flotation plant.



End of the conveyor belt is shown here. In the background are the Phillipson crushing plants and the loop over which the ore trains return to the mine. In the left foreground is the fine ore conveyor leading from the fine crushing plant to the new mill.

a minimum of development is necessary to begin mining.

Storke Level Developments

Plans for the new Storke level, 300 feet below the Phillipson, call for the caving of the initial block early in 1953. It is expected that the block can be caved without trouble as the ore is much softer than on the Phillipson level. The greatest portion of Storke level development openings has to be supported, mostly by concrete. A measure of the hardness difference between the ore is indicated by the fact that carbide-tipped bits averaged 20 feet of drilling on the Phillipson and 100 feet on the Storke.

The Storke level will be operated as a separate unit because it has its own compressed air plant, and other units. A five-inch, inclined diamond drill hole is being sunk from the Phillipson to the Storke through which to pass a high-voltage, electric power cable. Boyles Brothers Drilling Company is making the hole by drilling a three-inch pilot hole and reaming it to five inches.

New Crushing Plant

Storke level ore will be trammed to a new crushing plant where one of the world's largest gyratory crushers, a 60-inch Symons primary gyratory, is being installed. A 4,700-foot-long inclosed, five-section belt conveyor will be used to transport the ore to a new storage bin adjacent to the main crushing plant. Ore from the bin will be conveyed to the top of the crushing plant where it will join Phillipson ore as feed to the primary screens ahead of secondary crushing.

Additional regrinding and flotation equipment is being added to the flotation cleaner plant to handle the flotation concentrate from the new primary mill.

Production of high-grade molybdenite concentrate sold under the trade name "Moly-sulfide" for use as a lubricant continues in the cleaner plant. Climax is conducting a large-scale research project to find new uses for this product which is of great interest in engineering circles.

Regular-grade molybdenite concentrate (86 per cent MoS_2) is reground in porcelain-lined pebble mills and floated six times to bring the grade to 99.2 percent.

Additional Housing and Water

The by-product plant has been enlarged so that all molybdenite tailing can be treated. Cassiterite, wolframite (52 and 68 percent WO_3), and pyrite concentrates are currently being recovered.

A four-mile-long, 26-inch-diameter, mill water supply pipe line, and a 240-acre domestic water supply reservoir and feeder pipe line have been completed.

Fifty three-bedroom houses and three large apartment buildings have been erected to house additional employees necessary for the increased scale of operations.

William J. Coulter is vice president, and C. J. Abrams is general manager; both men are headquartered in Denver. The operating staff at Climax is headed by Frank Coolbaugh, resident manager; Robert Henderson, general superintendent; John Petty, mine superintendent; and Max Dessau, mill superintendent.

The new grinding-flotation mill building is shown at the left. Conveyor from the crushing plant makes a right-angle turn in the tower in the foreground.

The first South African by-product uranium plant shown here was placed in operation on October 8, 1952 by the West Rand Consolidated Mines, Ltd. at Krugersdorp, Union of South Africa. A complete new plant has been built to recover gold and silver, and the uranium. Ore arrives in cars (at the upper right), is crushed, conveyed to the grinding building (top center) and to the cyanide plant (upper left). Cyanide tailing enters the uranium plant on the horizontal belt conveyor leading to the large leaching plant in the foreground. The sulphuric acid plant is visible at the left center.
Photograph by Rand Daily Mail, *Johannesburg*

SOUTH AFRICA'S FIRST URANIUM

West Rand Consolidated Mines Ltd. starts its $3,300,000 plant to recover by-product uranium from Witwatersrand gold ore; building 12 more plants

The Union of South Africa became the latest member of the community of free nations producing uranium on October 8, 1952. When all of the presently planned by-product uranium plants treating gold tailing are placed in operation in late 1957, South Africa may well be the world's largest producer.

On October 8 the new plant of the West Rand Consolidated Mines, Ltd., was placed in operation by the South African prime minister, Dr. D. F. Malan, before a distinguished gathering of mining men from the United States, United Kingdom, and South Africa.

The new plant was completed in 22 months at a cost of about $3,300,000. The governments of the United States and the United Kingdom financed the project, with sales of uranium guaranteeing repayment.

Operation of the plant is the culmination of a long series of events which started in 1923 when the presence of uraninite in the gold concentrates of the Witwatersrand was first recorded by R. A. Cooper in a paper read before the Chemical, Metallurgical and Mining Society of South Africa (see box).

Of equal importance has been the development of the Bird Reef Series' conglomerate gold-uranium beds by the West Rand Consolidated. From a small inclined shaft started on August 3, 1931, the company has driven more than 45 miles of development openings to a depth of 2,000 feet on this low grade gold ore body. The result was that a fully-developed uranium mine is now available for immediate production on a large scale to supply the free world's ever-increasing need for uranium.

MINERALS CONSTITUENTS OF RAND CONCENTRATES

Another extremely interesting mineral is found in the heaviest concentrates on many mines of the group extending from the Boksburg fault west to the Central Rand, up to the present investigations have not been carried out on concentrates from the more westerly mines.

This mineral is a variety of "Uraninite" and a concentrate carrying a large proportion of it is shown here. It has the black colour and brilliant lustre of polished jet and the concentrate is of the following composition:—

	Per cent.
Uranium Oxide	49.1
Thorium Oxide	1.6
Cerium Group Oxides	0.2
Yttrium Group Oxides	1.5

Process Development

The economic extraction of uranium from certain of the gold ores of the Witwatersrand presented many difficult problems, largely because of the minute uranium content.

Cooperation of the various mining companies, the South African Government Metallurgical Laboratory, the Transvaal Chamber of Mines and various United States and United Kingdom laboratories developed a process which was first tested in a $280,000 pilot plant. All this work paved the way for the design and erection of the full-scale plants.

Sulphuric acid is the key to uranium recovery and many of the new plants are including a sulphuric acid plant as part of the uranium recovery system. Pyrite, recovered as a by-product from certain gold ores, is used as the source of sulphur. Dorr Fluo-Solid roasters make the SO_2 gas, which is converted to SO_3 in a catalytic tower containing fixed beds of V_2O_5 and SiO_2. Each of the

sulphuric acid plants costs about $2,000,000.

Leaching and Precipitation

The uranium oxide and certain other constituents of the Bird Reef tailing, from which gold and silver have been extracted in the new cyanide plant, are leached with dilute sulphuric acid in rubber-lined tanks. Batch leaching is used, with each tank being agitated for about 16 hours.

The agitated pulp is filtered on rotary vacuum filters. The filtered pulp is repulped with make-up water, agitated in a separate set of agitators, and again filtered to extract a maximum amount of uranium oxide. Filter cake is the final tailing. The first and second filtrate, containing the uranium, are combined for subsequent treatment. This includes a process of ion-exchange.*

Iron, alumina, and silica, which are dissolved with the uranium, are precipitated first and filtered from the uranium bearing solution. The uranium is finally precipitated as U_3O_8 from the purified solution on vacuum filter presses. The precipitate is transported to a central calcining plant which will dry and pack U_3O_8 from all the Union's recovery plants for shipment to the United States and England.

Use of Manganese Dioxide

Manganese dioxide is used as an oxidizing agent in the leaching process and goes into solution as $MnSO_4$. The barren solution (after uranium precipitation) contains this sulphate from which the manganese is recovered and reused. It is first precipitated as MnOH, oxidized to MnO_2, and then returned to the uranium leaching section. Considerable quantities of CaO and $CaCO_3$ are used for neutralizing the acidic solution. A special plant, separate from the main leaching section, prepares these basic solutions for use as a slurry.

Once the pulp has been treated with sulphuric acid it becomes difficult to filter. Normally, this would have required a greater number of filters for the same capacity. However, it was found that the addition of small quantities of animal glue to the acidified pulp increases the filtration rate.

Acid Resistant Plant

The use of an acidic circuit makes it necessary to protect certain sections of the plant with an acid-resistant covering, such as rubber lining for steel and cast iron tanks, acid-proof brickwork for concrete, and stainless steel or plastics for those places where internal and external protection is needed. Special paints are employed as protection against acid fumes or drips. At present, the canvas filter cloths have a very short life, but will probably be replaced by filter cloths to be woven from synthetic fibers.

At present all uranium is being exported, but South Africa has the right to use as much uranium as it needs for its own purposes. Plans are underway for the possible application of atomic power in South Africa using the uranium as a fuel.

For the gold mining industry, a new epoch has started.

Photograph by G. Cassel, Johannesburg

Dr. D. F. Malan (second from left), prime minister of the Union of South Africa, closes the electric switch to start the uranium plant. He is aided by Sir George W. Albu (left) chairman West Rand Consolidated. Eagerly watching are J. H. Viljoen, South African minister of mines; Jesse C. Johnson, United States Atomic Energy Commission; and C. G. Meyer, consulting engineer, West Rand Consolidated.

The flags of the United States, Union of South Africa, and the United Kingdom form an appropriate backdrop illustrating the cooperation which culminated in the opening of the first South African by-product uranium plant. The distinguished guests shown (left to right) are: A. R. Mitchell, acting South African government mining engineer; H. A. J. Rumbold, deputy United Kingdom high commissioner to the Union; Dr. T. K. Glennan, commissioner, United States Atomic Energy Commission; Sir John de Rougetal, United Kingdom high commissioner; J. G. N. Strauss; C. S. McLean, president, Transvaal Chamber of Mines, and technical director of West Rand Consolidated; Dr. D. F. Malan, prime minister of the Union of South Africa; Sir George W. Albu, chairman, West Rand Consolidated; J. H. Viljoen, South African minister of mines; Jesse C. Johnson, United States Atomic Energy Commission; C. G. Meyer, consulting engineer; and F. C. How, United Kingdom minister of supply. Others present included D. A. Robertson, acting United States ambassador to the Union, and Major C. S. Goldman, who has been associated with West Rand Consolidated for 49 years.

Photograph by G. Cassel, Johannesburg

* This is reported as one of the key steps in the process, but no details have been released to date. —Ed.

WHAT MAKES A MODERN MINE HOIST?

Spokane-Idaho's hoist features equal fleet angles, 100 percent electric operation, Lilly safety control, Logan trip chart, exact skip spotting, and automatic greasing

By H. G. Coulson*

Chief Engineer, Coeur d'Alene Hardware & Foundry Co., Wallace, Idaho

After deep-level development proved successful at the Constitution mine of the Spokane-Idaho Mining Company on Pine Creek in Idaho's Coeur d'Alene district, the company found that hoisting was a bottleneck to increasing output. In order to increase hoisting capacity and speed, and to insure a large enough hoist for future requirements as mining progressed deeper, the company called on the Coeur d'Alene Hardware & Foundry Co. to design and build a new mine hoist.

The mine, 15 miles from Kellogg, is developed through a 900-foot crosscut adit and a three-compartment, vertical underground shaft. Eleven levels have been established to a depth of 2,000 feet below the adit. A tandem-drum hoist was chosen as best suited for the conditions at the mine. While the general idea of a tandem-drum hoist is not new, this modern hoist incorporates some novel and important modifications which make it of great interest to mining men everywhere.

The hoist was installed late in 1951 and placed in service during January 1952; since then it has been in continuous operation. Much credit is due to the engineering, mechanical, and electrical departments of the Spokane-Idaho Mining Company for the fine job of installation which was done with a minimum of supervision by the manufacturer.

Surface plant and differential flotation mill of the Constitution mine of the Spokane-Idaho Mining Company in the famous Coeur d'Alene mining district. The new hoist is installed 900 feet underground in the adit which portals behind the mill buildings.

General Specifications

The hoist rating is 600 hp. It is driven by two 200 hp., continuous-rated, wound-rotor, 2200-volt Westinghouse motors provided with full-magnetic control panels. With this motor equipment, the nominal performance of hoist is 18,000 pounds rope pull at 1000-feet-per-minute rope speed. Rope capacity is well over 3,000 feet of 1-inch rope wound in three layers on each of the 62-inch diameter by 75-inch face cylindrical steel drums.

Main and pinion shafts are of alloy steel, and together with the drums, are mounted entirely upon SKF spherical roller bearings, in accordance with long-established Coeur d'Alene Hardware & Foundry Co. practice.

Each drum is fitted with a multiple-disc clutch, a highly successful feature of Coeur d'Alene double-drum hoists for the past 30 years. These clutches are compact and powerful, with very low moment of inertia compared to their strength; they require small collar travel to throw into or out of engagement, and need adjustment only at long intervals.

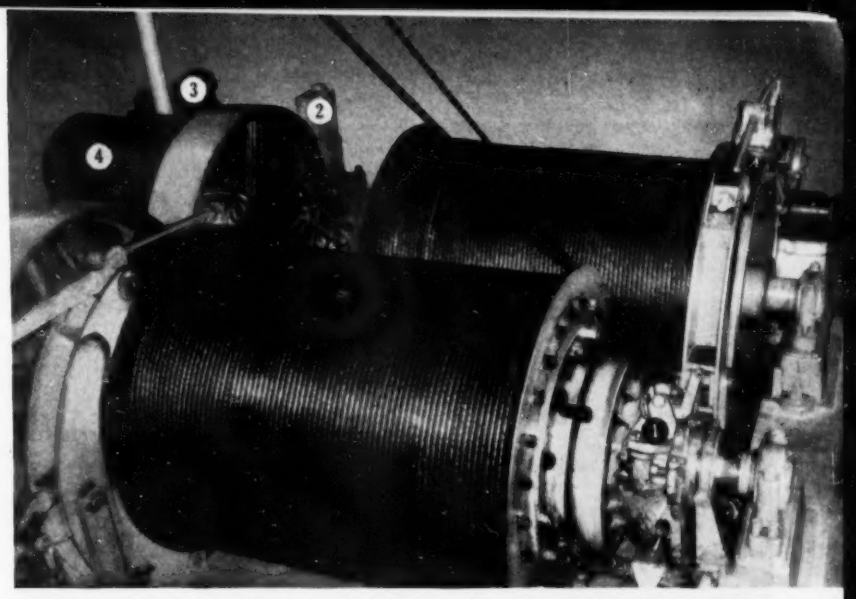
Compact For Underground Use

Compactness was secured by placing drums as close together as possible and by meshing main-shaft cut helical gears directly with each other, thus producing opposite direction of rotation in the two drums. With over-wind of rope on both drums and a proper location of head-sheaves, a condition of parallel rope-fleeting planes is obtained, by which, without idler sheaves, there is no danger of rope interference at

* *Registered mechanical engineer, State of California, and originator of all advanced features of the Spokane-Idaho hoist.*

cross-overs as the two ropes fleet from end to end of drums. See dimension P in the accompanying diagram. As a practical consideration, the distance H1 could be made equal to H for simpler head-sheave mounting and still retain adequate vertical clearance for the ropes.

Drums were offset endwise just enough to provide ample clearance for inside brake posts and the multiple disc clutches. Then the hoist was located, in plan, at an angle "A" from the longitudinal center line of the three-compartment vertical shaft such that the center to center distance O, sidewise between the sheaves, is exactly equal to the drum offset. By this arrangement, the fleet angle is the same at each end of each drum, thus making possible a minimum length of rope raise. Over-wind on both drums makes possible minimum vertical dimension in raise cross-section.



View of the Coeur d'Alene hoist at the Constitution mine as seen from the rope raise. At lower right (1) is the forward drum clutch, the rear gear-lubricant reservoir is designated by (2), the motor-generator set for dynamic braking by (3), and the rear drum drive motor by (4).

Special, Novel Features

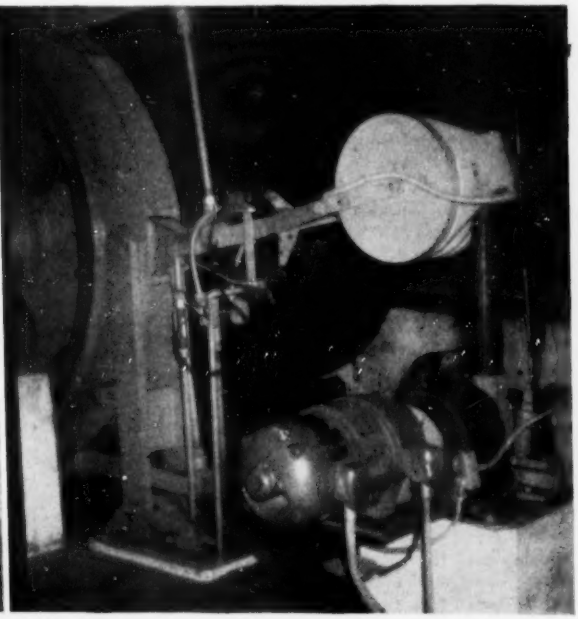
Besides the compact, tandem-drum arrangement described above, this hoist is 100 percent electrically-operated.

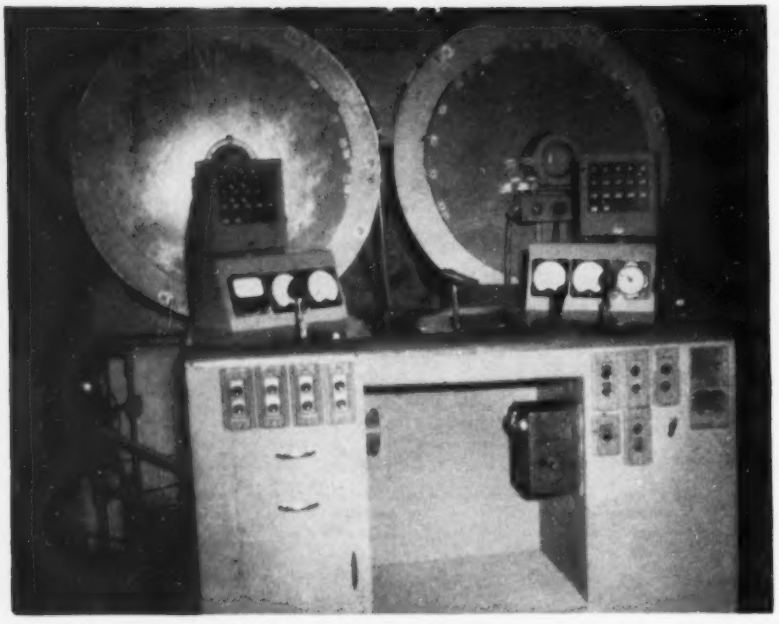
Clutches are engaged and disengaged by gearmotors, equipped with magnetic brakes. Stroke travel is controlled by limit switches.

Electric brake control (Pat. Pend.): The hoist is equipped with standard, gravity-applied, parallel-motion post brakes. The release and control assembly comprises a Louis-Allis-Dynamatic Corporation clutch motor, a gear reducer, a Hilliard over-running clutch, a reverse-acting solenoid-activated, shoe-brake and a pinion and rack for connection to weight lever. Brake motors run continuously, idling most of the time, and taking load only when the d-c coil of the dynamatic clutch becomes energized. Current for this is supplied from a small generator. Degree of weightlifting torque (the more torque the less braking effect on hoist drum) is controlled from the operator's hand lever in a series of steps in which micro-switches vary the quantity of resistance in the d-c clutch coil circuit. Amount of braking can thus be controlled to a finite degree. Weight is held in the fully released position by the solenoid-applied shoe brake. No torque is supplied by the brake control unit in either the "on" or "off" brake positions. The over-run-clutch prevents undesirable extra jamming at full brake application, which would otherwise occu. because of rotor-spin inertia.

In the event of power failure when the cage is not near travel limits, brakes automatically set at a slower speed. The Lilly brake regulators are provided with switches and resistors by which increasingly faster

LEFT: The clutch operating unit is shown in the clutch-engaged position on the new hoist of the Spokane-Idaho Mining Company. RIGHT: The electrical brake release and control unit (Pat. Pend.) shown with the brake released.





The advanced-design control desk with the large diameter concentric-dial depth indicators. The forward drum Lilly safety control is just to the left of the desk.

brake application is secured if power should fail when the cage nears a travel limit.

Equal Control, No Oil Leaks

To sum up: Electric hoist brake control matches the performance of hydraulic control and naturally eliminates piping, pumps, and accumulators, as well as the oil leakage which seems always to be present. As might be expected, the pioneer electric control development was more expensive, but in subsequent installations the cost will be comparable to that for the hydraulic system.

Control desk: Control levers are mounted on a desk located at floor level, with desk height such that the operator can proceed with equal facility, either seated or standing. The control features are believed to provide the greatest ease of hoist operation so far developed.

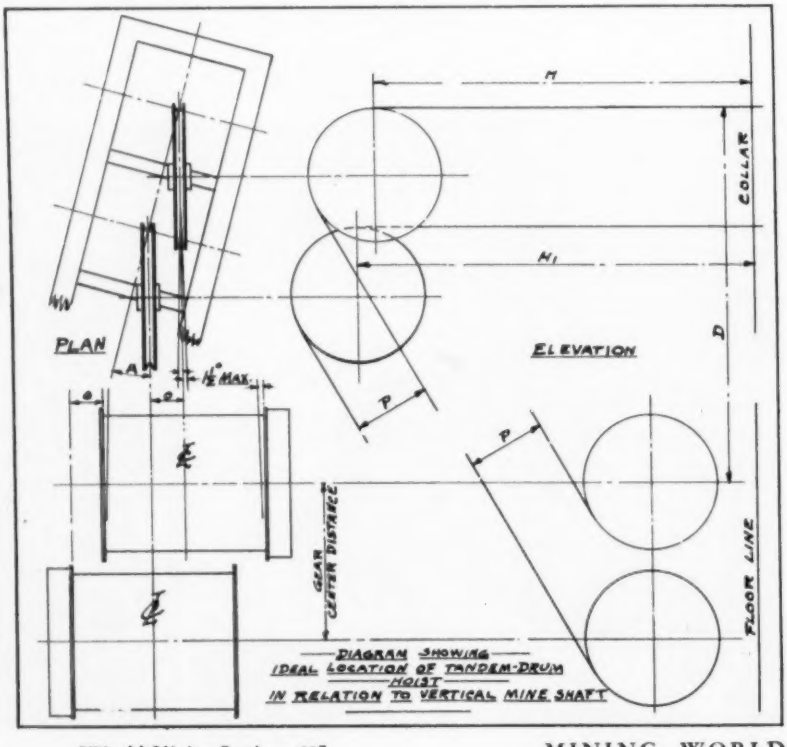
Since standard manufacturers' master switches require too much effort to be suitable for desk application, a special unit was designed. Driving motors are controlled from the operator's hand lever through a mercury drum switch (Pat. Pend.) which actuates relays; they in turn energize the main primary and secondary contactors on the standard control panels.

The master-switch operating-lever moves in an "H" slot forward and back at the right side for directional and speed control when driving with a-c power. Neutral position is at the middle point both sidewise, and front and back. Movement to the left throws in d-c dynamic braking, and movement backward, at the left, increases this braking in the usual secondary steps.

These steps have heretofore been found to be too great for smooth control (resulting in either too little or too much braking at any given time). This control corrects that difficulty by providing the master-switch lever with an additional movement, a twist motion from a "D" or "spade" handle which acts through suitable gearing to operate a series of micro-switches which in turn control the field excitation of the dynamic braking generator. This arrangement provides a sensitive, micrometer control by which the operator is enabled to "trim" the degree of braking between each of the standard secondary steps to obtain a uniform rate of lowering at any speed which may be desired at the time.

As may be noted from the photograph of the control desk, the "three-in-one" master-switch lever is located at the middle of the desk. Spaced at a convenient distance to each side of the middle is a combination brake and clutch control lever, which is moved in a forward and back direction for brake control, and sidewise at the rear position for throwing the clutch into and out of engagement. Brake and clutch movements are mechanically and electrically interlocked so that brake and clutch, on a given drum, can not both be disengaged at the same time.

Farther to the right and to the left are located the Lilly man and skip speed-selecting levers. These are connected by "push-pull" cables ex-



tending downward in the desk, through horizontal pipe runs below floor level and up to their respective levers on the Lilly model "D" safety controllers. These are the only mechanical connections from the desk, all other operations being effected through electrical conductors.

Electric Skid Dump Control

The left-hand Lilly speed selector has an additional function which is brought into play by moving the lever from the middle, or normal speed setting, to the end of travel opposite the man-speed position. This movement simultaneously sets the controller limit for the 600-level waste dump and actuates a solenoid air valve to move the retractable skip-dumping cams into operating position at that point. Pilot lights on the desk, energized by limit switches at the pocket, indicate to the hoist operator the actual position of the dump mechanism, thus verifying the condition represented by his lever position. Pilot lights on the desk top also indicate the actual "on" and "off" settings of brakes, and the "in" and "out" positions of clutches.

Various control push buttons are located on the front of the desk at right and left of operator's position. The farthest pair out on each side serve as a backout switch. Using buttons and separating the two directions in this manner serves exactly the same purpose as the usual drum-type back-out switch, besides providing a much neater desk mounting.

Indicating instruments are located in diagonal banks on each rear corner of the desk, leaving ample indicator view between. Instruments at right are: speed indicator, a-c ammeter and clock. At left: d-c ammeter and voltmeter for dynamic braking and d-c voltmeter on brake clutch-coil current supply.

Above each instrument bank, at right and left, is an annunciator (not a part of the hoist equipment) added by the mine staff for the purpose of indicating to the hoistman from what mine station any call signal may have originated. The object is primarily to provide a check on unauthorized calls (i.e.: not made by cager).

Besides the Lilly safety controllers, each drum has a Logan recorder which produces 24-hour chart records of all hoist movements as well as inoperative periods.

Improved skip indicators: A radical departure from previous practice is provided in concentric dial indicators located closely, side by side, and just a few feet ahead of the operator. Dials (instead of pointers) rotate, and adjustable *stationary* pointers are provided. The forward dials turn slowly and are geared for about nine-tenths of a revolution for maximum shaft depth. These indicate levels to within one drum revolution. Rear dials are larger in diameter, show 5 inches of face beyond the edge of slow dials, and rotate at drum speed, thus providing for the exact spotting of cages at mine stations.

The advantages of concentric rotating dials are, first, that the operator's cone of vision is quite small (no need to shift sight through a wide angle to pick up another marking), and, second, that on the fast dial he can sight the desired marker one-third to one-half drum revolution in advance of stop position by the earlier method of placing exact spotting markers on drum flanges, the operator can see the desired spot not more than one-sixth of a drum revolution, at most, and in one direction only. In the other direction of rotation, the desired marker is generally visible only a few degrees before it reaches the pointer, and in this case the operator must determine its approach by other markers which he remembers precede the one wanted.

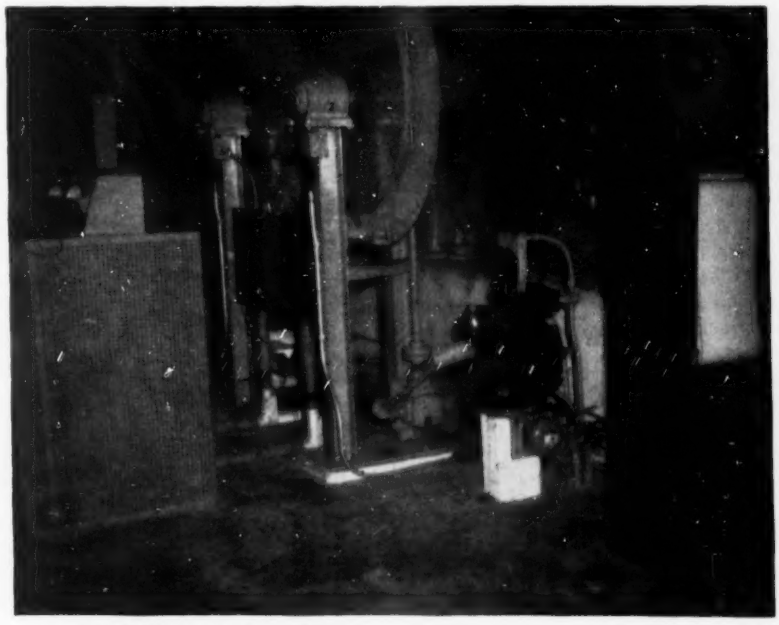
Speed reduction between two concentric dials is accomplished through a compact Brad Foote "Gyro" unit (about 200 to 1 ratio in this installation) placed in front of the slow dial on a small column. These gear reducers are especially modified for the purpose by having both the input and output shaft extensions on the same side of the housing.

The new dial markers consist of printed stickers, which are re-usable and may readily be shifted to new positions when necessary after extreme rope stretch.

Gear lubrication: The gear train is lubricated automatically at adjustably timed intervals by two fixed spray guns, in a similar manner to paint spraying. Guns are located on opposite sides of the two large gears and operate alternately. Since clock timing is obviously unsuited to this application, the drive is from the end of one main shaft through reduction gearing and then through a "zero-max" variable-speed transmission to cam-operated micro-switches. This kind of unit is especially adapted to the purpose because the direction of output rotation remains the same regardless of the direction of input rotation, besides the fact that the output speed is infinitely variable over a wide range. the spray guns are operated by solenoid air valves energized by micro-switches. Spray duration is adjustable by cam settings, and the character of the spray is adjustable at the guns.

I wish to acknowledge the excellent cooperation given by all members of the Spokane-Idaho staff.

From left to right are: the end of the control desk; skip position dials with columns and gear reducers in front, and a rear column with right-angle, enclosed, lower drive gear; rear-drum Lilly controller and drive; and the rear-drum Logan recorder. The two cabinets between the columns in front of dials house relays for the annunciators.



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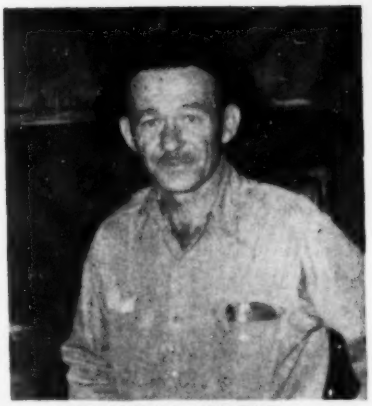
Claude Fertig Reports

PHILIPPINE MINE CRISIS

Terms of Minimum Wage Law imperils all mining despite all-out company efforts to cut costs and raise miner's output



CLAUDE E. FERTIG,
Assistant General Superintendent, Itogon Mining Company

The Philippine gold mining industry is in a precarious position at the present time. This is due largely to the minimum wage law which requires the mining companies to pay the initial statutory wage of Pesos 4.00 to all workers. The gold companies had appealed for a six-month extension, and the other mines for a three-month extension, before the law would become effective. On October 6, 1952, Philippine labor secretary Jose Figueras rejected the Wage Board's recommendation for the delay. The mines are faced with an increased cost of Pesos 3,000,000 during the three- to six-month period. About 25,000 miners and 100,000 dependents are also involved.

The Atok-Big Wedge Company, one of the largest gold producers, announced in mid-October its plans to cease operations in November because of the added costs imposed by the minimum wage.

In the following article, Claude E. Fertig, assistant general superintendent of the Itogon Mining Company, outlines the work necessary to reopen the mine following the end of World War II, summarizes the present activities of the company, and describes the steps taken to increase efficiency and reduce costs so that Itogon can continue operating.—Ed.

An old Philippine legend relates that many years ago a golden deer crashed into the mountain near the present shaft site of Itogon Mining Company near Baguio in the Mountain Province of Luzon. Apparently it was quite a crash for gold was scattered far and wide. The problem of gathering the parts of the golden deer has been going on steadily ever since.

Early-day prospectors Nels Peterson and Blondy Howard staked the first claims covering the area. In 1915, Mr. and Mrs. Nels Peterson acquired all of the claims. Practical development was started by Mr. and Mrs. Jan Marsman in 1924; they organized the Itogon Mining Company in 1925, and poured the first gold bar in 1926. Operations progressed steadily and successfully until December 1941. Before World War II closed down the property, Pesos 34,774,349.18 worth of gold had been recovered. Liberation day found the mine a catacomb of caved and flooded tunnels, the mill and surface plant a mass of burned and twisted steel.

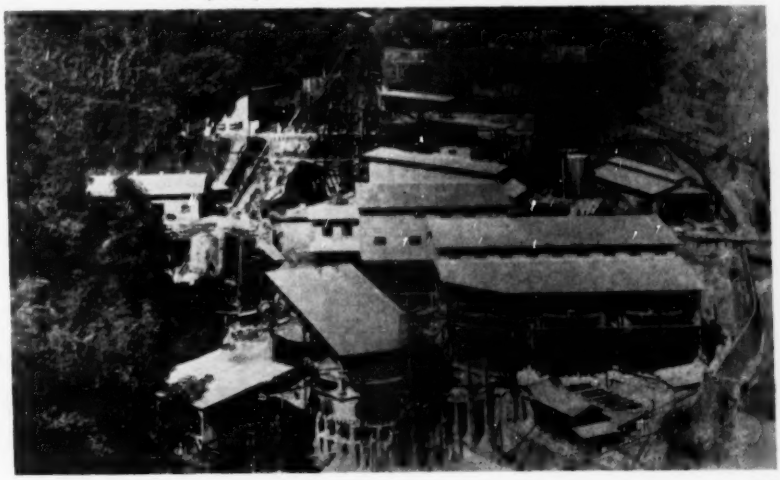
Postwar Rehabilitation

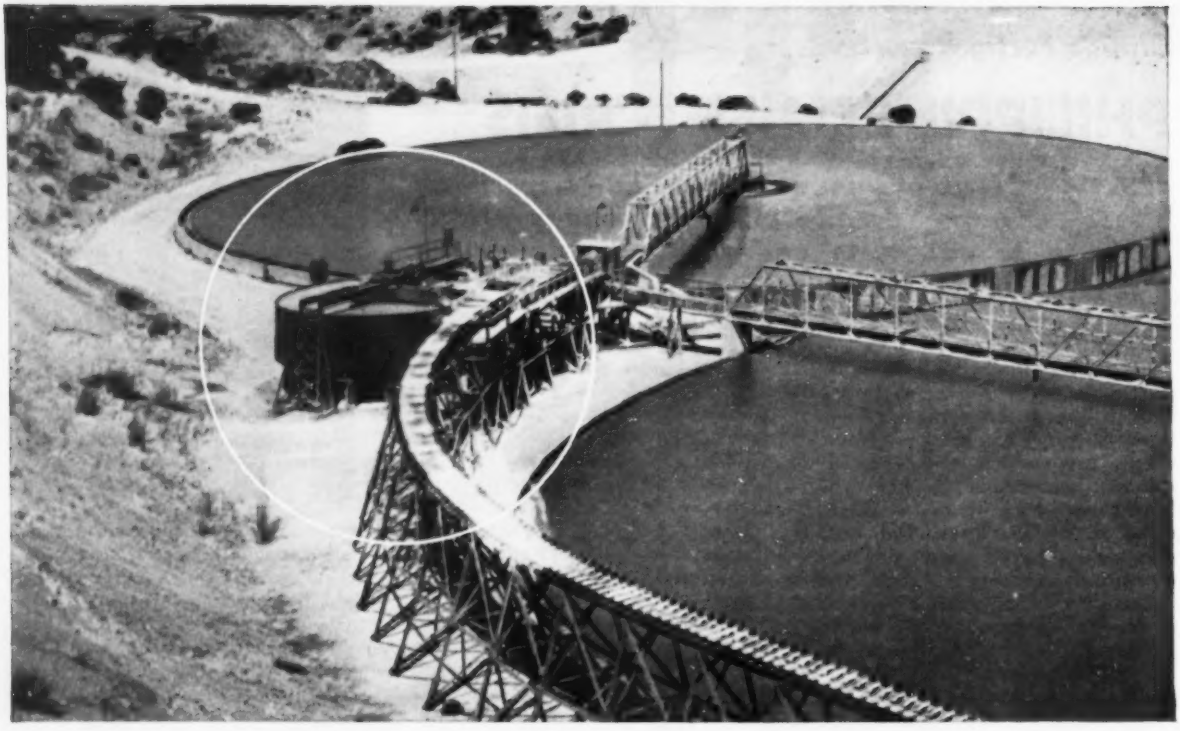
In 1950, with the aid of governmental war-damage money, Marsman & Company, Inc., managers of Itogon, started rehabilitation work. When I joined the staff in April of that year, C. A. Weekley, the general superintendent, had started cleanup work on the mill site, opening of the main drainage adits, construction of a camp, and placement of orders for necessary supplies and equipment. Henko Doornbosch, power superintendent for the Marsman-managed mines, was busy collecting and assembling a power plant from other properties.

Cleanup and construction were going along at a steady rate when adverse things began to happen. Heavy rains made handling of equipment difficult. The Korean War made management stop and think about the future. Exchange tax, import control, minimum wage laws all combined to push costs higher and higher. It began to look as though we could not complete the 300-ton mill with available funds, and that the ore from the fairly rich Itoe vein could not support the higher costs.

The Philippine government came to the aid of the company through its Rehabilitation Finance Corporation. Sufficient money was advanced to open up part of the mine, build

Taka shaft and 800-ton cyanide mill of the Itogon Mining Company, near Baguio, Mt. Province, Philippine Islands. Since 1950 the extensive war damage has been repaired, the mine reopened, and the mill rebuilt to treat 800 tons per day.





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in spite of increased tonnage . . . changing ore characteristics

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1. Mill output *increased* by an average of 1,000 tons per working day.
2. The amount of water lost in thickener underflow *decreased* by 166 gpm.

The Summary of Operating Data shown here gives additional information, before and after the installation of the Dorr Hydroseparator.

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*Reg. U.S. Pat. Off.

Dorr Hydroseparator
Summary of Operating Data
Castle Dome Copper Co., Miami, Arizona

Year	Feed to System Avg. Tons Per Day	Character of Feed	Percent Solids Combined Underflow
	WITHOUT HYDROSEPARATOR		
1948 (Jan.-June)	10,406	Hard Ore	44.5
Dorr Hydroseparator Installed July 1948			
	WITH HYDROSEPARATOR		
1948 (Aug.-Dec.)	11,436	Hard Ore	45.2
1949	11,814	Variable Ore	46.4
1950	11,905	Variable Ore	47.8
1951	12,076	Variable Ore	47.9

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Development Costs Per Foot, In Pesos, For 1941 and 1952, and Feet Per Man-Shift in 1952 at Itogon Mining Company, Baguio, Philippine Islands

Type	1941 Cost Per Foot	1952 Cost Per Foot	1952 Feet Per Man-Shift
	CAPITAL DEVELOPMENT	(Pesos)	
Drifting	12.02	26.21	0.382
Crosscutting	9.05	13.39	1.840
Counter Drive	12.02	23.72	0.335
Drain Tunnel	——	31.32	——
Average	——	——	0.351
	OPERATING DEVELOPMENT		
Drifting	——	14.29	0.641
Raising	——	27.62	0.402
Averages	13.70	22.92	0.419

the mill, and start operations on September 13, 1951.

Geology

Itogon ore come from three major vein systems: the Sesame, the Taka, and the higher grade Itoe discovered in 1940. Each consists of many splits and lacer veins.

The rock formation at Itogon is generally composed of diorite and its derivatives: quartz diorite, hornblende diorite, and gabbro diorite with a later intrusion of Tertiary andesite.

The vein system occurs as a filling of fissures in the diorite. The gold occurs in a coarse or finely divided state. Tellurides have been found in the Itoe vein. Quartz is common in all veins, with gray-colored quartz being the most common gold carrier. Calcite is a poor indication of gold unless colored with rhodochrosite. In the Itoe vein, there is a vuggy quartz, combed with gold, presumably deposited by enriched solutions.

The Itoe vein, striking N. 70° E. similar to other veins, was considered of high enough grade to offset the increased costs, and so all mine rehabilitation efforts were directed towards opening this vein.

Mining Methods Set by Veins

The mine is drained and ventilated through five adits and two shafts that open to the surface. These are the 0, 50, 300, 500, and 875 levels, the Taka shaft, and the Sesame shaft. (Level numbers are based on the approximate footage depth below the 4,000 foot-elevation of the collar at the Taka.) The O level is the warm-air discharge for the Itoe area. The Taka shaft up-casts air from the Taka area, while the Sesame shaft up-casts from the Sesame area with the air reaching the surface through the 50 level.

The 500 level, which portals near the miners' housing area, is the site of the mine office and the main man entry. The 300, 500, and 875 levels are supply entries and are served by aerial tramways from road side stations. Transportation and availability of mine supplies are major cost items since storage facilities are limited along the narrow mountain roads. Timber, for example, must be unloaded in the storage area 4 kilometers from the mine, then transshipped, as required, to the various mine stations. Efforts are being made for more modern methods of handling supplies through larger stations, faster trams, and packaged delivery of timber.

The 2½- to 4-foot-wide Itoe vein now provides 55 percent of the ore. It is generally mined by inclined rill stopes that have been developed through previously driven supply, manway, and fill raises 100 feet apart. The 23 vein of the Sesame series supplies 19 percent of the ore and is generally mined by four-panel stopes. This method leaves an extra panel for dumping waste sorted from the ore.

The Taka vein provides 13 percent of the ore and is mined by standard square-set stopes. Gilkinson vein, of the Sesame series, supplies 4 percent of the ore. It is one of the better grade veins but has little ore remaining above the 875 level. It is hoped that it will contain ore in depth. The balance of the ore comes from rehabilitation work in the Sesame and 31 vein.

All production is hoisted through the Taka shaft, located at the mill site. Skips, in balance, each hoist 3-ton loads from the 625 or 960 ore pockets that have been filled from ore trains on the 500 and 875 haulage levels.

Drain Tunnel Reopening

Before the war, an 11- by 11-foot drain tunnel at the 1300 level elevation had been driven 3,500 feet of its projected 5,000-foot length to end at the Taka shaft. Reopening of this drain tunnel through a tightly caved

C. A. Weekley (LEFT) general superintendent has overcome many obstacles in bringing Itogon to its present efficient operating state. T. J. Lawson (RIGHT) mill superintendent has reduced milling costs from 4.14 Pesos to 3.24 Pesos per ton in two years.

area 150 feet long required record-sized wooden spiling. Water temperatures reached 190° F., rock temperature 170°, and air temperatures 150°. Recovery was a slow tedious job, rewarded occasionally with a few hundred feet of open tunnel, and finally with 1,200 feet of open tunnel to the face 3,500 feet from the portal. Rail, pipe, and trolley lines were found in place which, in these days of high prices, are more valuable than finding a new vein. A security by-pass was driven between points 650 and 900 feet from the portal; the first 900 feet of the tunnel were lined with reinforced concrete one foot in thickness. Work was resumed at the face on October 15, 1952, under a changed plan to drive first to 23 winze and then to the Taka shaft.

Deep Development Pushed

All efforts during 1950 and 1951 were directed toward the rehabilitation of drifts and crosscuts leading to the Itoe vein. During this period, 39,273 feet of workings were opened, of which only 2,402 feet were new development.

The future of Itogon is based on the extension of the veins to the 1,300 level in order to develop 425

Capital And Operating Development Footage Driven By Itogon Mining Company, Baguio, Philippine Islands, For January to September 1952

Type	Footage In Ore	Footage In Waste	Total
	CAPITAL DEVELOPMENT		
Drifting	4,032	2,138	6,170
Raising	19	81	100
Crosscutting	——	2,479	2,479
Winzing	13	11	24
Shaft Sinking	——	68	68
Ore Pockets	——	76	76
1300 Drain Tunnel	——	1,337	1,337
Totals	4,064	6,190	10,254
	OPERATING DEVELOPMENT		
Drifting	1,401	186	1,587
Raising	1,835	362	2,197
Crosscutting	——	298	298
Totals	3,236	846	4,082
Grand Totals	7,300	7,036	14,336

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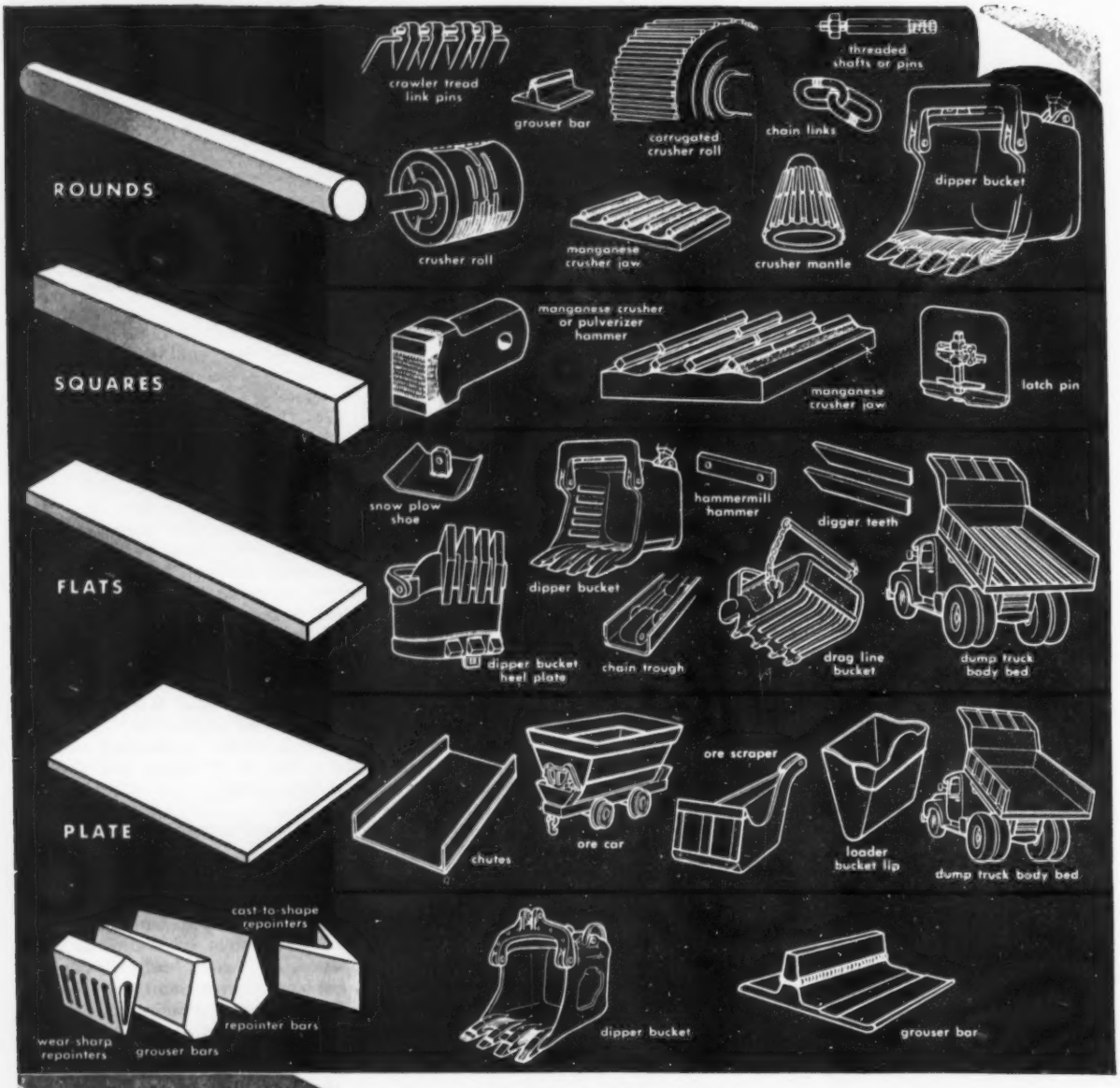

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vertical feet of additional ore in each vein.

In 1952, the development and rehabilitation program was materially increased to overcome the previous curtailment and to meet the additional requirements of the mine. It consists of sinking a prospect winze on the Itoe vein and rehabilitating 23 winze which is an interior shaft in the Sesame area completed before the war from the 500 to the 1,120 level. Its ultimate goal is the 1,300 level.

Development in virgin ore has been mainly on the main Itoe vein and several of its promising splits. One undeveloped footwall split on the Taka vein is being drifted on. Itoe vein extension eastward and westward is being developed on all major levels. Balatoc Mining Company's claims form the end line on the west and the Frog Fault is believed to be the eastward limit, making a total length of 2,300 feet. Vertically, the vein is being developed through the 18 winze below the 875 level where 196 feet of drifting has been accomplished on the 975 level. Spectacular ore, as previously found in the central portion above the 500 level, has not been found in depth. However, ore of sufficient grade has been developed to maintain ore reserves.

Cyanide Mill

Rebuilding the mill, mostly from salvage materials, and the problems met in keeping it in operaton are of sufficient scope to be presented as a separate article, but I requested T. J. Lawson, mill superintendent, to prepare a brief description of the mill which follows.

From September 1951 to August 31, 1952, the mill treated 141,476 short tons of ore, from which 38,-851.367 ounces of fine gold have been recovered. Extraction has averaged 90.91 percent, with a recovered value of Pesos 18.092 per ton of ore.

The Itogon mill employs straight cyanidation for recovery of the gold and silver. Ore delivered from the mine is separated into coarse and fine sizes by means of a grizzly, the fine ore being deslimed by a washer, the coarse ore being reduced in size by means of primary crushers. Both washed and crushed ore go to secondary crushers and then to the fine ore bin.

Two 6- by 8-foot ball mills in closed circuit with classifiers grind the ore to approximately 60 percent minus-200-mesh. The bowl classifier overflow goes to three primary thickeners in parallel; overflow of these thickeners is the pregnant or rich solution, while the underflow goes to four agitators in series. Discharge of No. 4 agitator, with barren solution added for wash, goes to three secondary thickeners in parallel. Part of the secondary thickeners overflow goes to mill water, and part to pregnant solution; the pulp underflow goes to the Moore filters where it is washed, filfered, and then discarded as tailing.

Collar of the Taka shaft through which all ore is hoisted.

The pregnant solution is clarified, de-aerated, and the gold and silver precipitated in a standard Merrill-Crowe precipitation unit. The precipitate is taken from the Merrill presses, fluxed, and melted to bullion in a Monarch furnace. Approximately 80 percent of the values are recovered as precipitate; the remaining 20 percent is caught in gold traps placed between the ball mills and spiral classifiers. This free gold ranges in size from very fine pieces to small nuggets weighing as much as 5 grams. Bullion produced from the "high grade" runs around 83 percent gold and 15 percent silver, while precipitate bullion averages approximately 64 percent gold and 20 percent silver.

The present mill is very similar to the prewar mill and utilizes as much of the old foundation, floors, etc. as possible. Part of the prewar machinery was reconditioned and used, but a great deal was beyond repair. Second-hand equipment was purchased from various parts of the Philippines and a few new and second-hand pieces from the United States to complete the mill. Nearly all of the tanks and all of the buildings are new.

Economics of Operations

The first three months of operations were the best, based on cost per ounce of gold produced, but cannot be considered representative because the ore pockets were full, and several thousand tons of Pesos 33.00 ore stockpiled from rehabilitation work. All values stated herein are at Pesos 70.00 per ounce ($35.00).

It was estimated that during the Japanese occupation, Igorot miners worked the high-grade area of Itoe, breaking some 7,000 tons of ore from which they cobbed the high-grade leaving some 4,000 tons of Pesos 33.00 fill in the incline rill stopes they worked from the various levels. This had to be removed and stockpiled during the rehabilitation period. Although this was better-than-average ore, the open stopes and dog holes left by these miners made it difficult to set up a standard and efficient method of stoping. During the 3½-month period of 1951, 32,972 tons of Pesos 23.02 ore were mined, from which the mill was able to extract Pesos 758,904.72 in gold at a recovery rate of 92.75 percent.

It was soon apparent that a larger tonnage was necessary to offset the rising cost, and so the Mines Division of Marsman & Company, Inc. ordered the mill capacity increased to 500 tons daily. This goal was reached in July and August 1951, when an average of 539 tons were milled daily.

The Future

After spending almost Pesos 3,000,000 in capital investment and Pesos 1,000,000 in warehouse supplies, the company is fighting to break even. It now faces an estimated Pesos 8.00 to Pesos 10.00 per ounce additional cost when the minimum wage is put into effect.

(*Continued on page* 77)

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EUCLIDS *Move the Earth*

John Wood, right, retiring president of the New Mexico Mining Association, officially turns over his president's gavel to W. P. Morris, new president, at the final session of the First Annual Southwest Mineral Conference. Wood is a member of the consulting engineering firm, Chapman & Wood, Albuquerque, and Morris is resident manager of the potash division of Duval Sulphur and Potash Company, Carlsbad, New Mexico.

SOUTHWEST MINERAL CONFERENCE

New Mexico Mining and Southwest International Mining Associations outline a program for an improved domestic mining policy at their joint meeting

What should the mineral policy of the United States be under the new national administration? For the answers to this all-important question over 600 miners met in Albuquerque, New Mexico at the First Annual Southwest Mineral Conference immediately after the national election. The conference was sponsored by the New Mexico Mining Association, and the Southwest International Mining Association.

Industry spokesmen from Utah, New York, Colorado, New Mexico, Texas, Arizona, and other states presented industry's suggestions, and New Mexico's United States Senator Clinton P. Anderson offered a plan for a Mineral Commodity Credit Corporation to buy excess production of metals to prevent a price drop and resultant mine closings.

Permanent Stockpile Urged

Otto Herres, vice president of the Combined Metals Reduction Company, Salt Lake City, Utah, voiced a hope for legislative remedies for preservation of the mining industry. He said, "It is believed that Congress will adopt constructive legislation to preserve the domestic mining industry provided the entire industry will unite on a sound program. Congress has established a precedent for a flexible tariff in the restoration of lead and zinc tariffs when prices dropped below 18 cents a pound after the duties were suspended during the Korean war shortages." However, he tempered this belief for constructive legislation when he warned about the State Department as follows: "Experience indicates that the domestic mining industry should build no high hopes of receiving consideration for an improved mineral policy at the hands of the State Department in Washington, regardless of how logical the case may be."

Herres urged a national stockpiling of strategic and critical materials on a permanent basis, adequate funds for such a program, and orderly purchases to stabilize markets. He called upon the government to provide a favorable political climate to insure "an industrial future beyond our most optimistic dreams."

Mining Program From Miners

Robert S. Palmer, executive secretary, Colorado Mining Association spoke at the opening session of the convention and gave a "Keynote on Mineral Policy." He urged that the government become constructive, that it adopt a realistic policy for all mining and that the nation's miners, not manufacturers, formulate a mining program. He referred to the recent "Paley Report" of the President's Materials Policy Commission and termed it "damaging to domestic mining." He called on all agencies to take action to refute the theories advanced by the report and suggested that the state mineral agencies could answer the theories most effectively.

Small and Large Mines

Dr. James Boyd, exploration manager, Kennecott Copper Corporation, New York, New York, was the featured speaker at the formal banquet of the conference. He spoke on "America's Need for New Ore Deposits," and said that the best way to aid the mining industry in finding and developing ore deposits was to remove the barriers imposed by the tax structure, problems of land tenure, and the growth of federal and state controls. Dr. Boyd believes that the fact that mining is the most speculative of all industries is not recognized and that the high degree of risk must be considered as part of the cost of production. Multiple ownerships have become a serious detriment to large-scale searches for new deposits, he added. Another barrier is growing due to the stifling government regulations and taxation. He said that "the in-

Speakers and session chairmen at the First Southwest Minerals Conference were, left to right: Dr. Eugene Thomas, dean of engineering, Texas Western University, El Paso, Texas, co-chairman; Frank A. Dennison, Jr., southwest district manager, Reliance Electric & Engineering Company, Houston, Texas; Robert S. Palmer, executive secretary, Colorado Mining Association, Denver, Colorado; A. J. Thompson, head of the Department of Mining and Metallurgy, New Mexico Institute of Mining and Technology, Socorro, New Mexico, co-chairman; and J. W. Picking, chief engineer electronics and control, Reliance Electric & Engineering Company, Cleveland, Ohio.

Prominent engineers and geologists of the southwest at the session on "The Geology of Disseminated Coppers" pictured from left to right: Earl Miller, Joy Manufacturing Company, El Paso, Texas; Dr. John E. Allen, geologist for the New Mexico Bureau of Mines, Albuquerque; J. W. Reinhart, American Smelting and Refining Company, Silver City, New Mexico; Reed Welch, manager ore purchasing department, American Smelting and Refining Company, Tucson, Arizona; Philip K. Laylander, consulting geologist, Ely, Nevada; and L. K. Wilson, chief geologist, Southwestern Division, ASARCO, Tucson, Arizona. Allen, Laylander and Wilson read papers at the session.

Copper and potash miners at the conference were represented by W. H. Goodrich, general manager, Chino Mines Division, Kennecott Copper Corporation; W. P. Morris, resident manager, potash division of the Duval Sulphur and Potash Company; F. H. Stewart, manager, Southwest Potash Company; Ben Shantz, Silver City mining attorney; L. H. Jones, United States Potash Company; and Roy Blackman, Potash Company of America.

dustry needs some degree of stability, and this is impossible when the actions of the government are constantly veering with the wind."

Dr. Boyd believes that there is no place in the iron or copper mining industry for the small operator unless he is fortunate in having an extremely high-grade deposit. However, he also believes that it is fortunate that a large organization can not effectively mine those minerals required in relatively small quantities. Pointing out the need for both small and large operators, he said that uranium, tungsten, and many other minerals could best be prospected for and mined by small companies and individuals, while mass mining of large low-grade deposits was the field for large operators. However, when and if a small organization finds a large deposit, it can be profitably turned to a large group, and, conversely, small deposits discovered by the large groups can best be turned to a small group for mining.

Wide Interest in Taxation

An outstanding session on taxation was arranged by conference program chairman E. P. Chapman, Jr., consulting geologist of Albuquerque. This session drew the largest attendance, was the subject of more comment, and was of greatest interest to the most people. John E. Kelly, natural resource consultant, Washington D.C., covered taxation in its broader concept with special emphasis on national developments, while Miles P. Romney, secretary, Utah Mining Association, Salt Lake City, Utah, reviewed taxes with special attention to the state level. Kelly noted how the coal industry had been successful in securing legislation treating the royalty received by coal land owners as capital gain. He added that it might be possible to obtain capital gains tax treatment for owners of all types of mineral lands.

He outlined the most urgent needs of tax relief to be: repeal of the unworkable excess profits tax; limitation of high corporate income taxes through a constitutional amendment, resolutions for which have been passed by 16 state legislatures, 36 needed; elimination of double taxation on corporation dividends which freezes risk capital, destroys the source of investment capital, and taxes up to 77 percent of earnings; a return of all possible tax powers to the States; make public projects self-liquidating and financed by revenue bonds; aboli-

tion of the capital gains tax which is a deadly threat to private investment capital; and financing of foreign aid programs by bonds rather than by the American taxpayer. He pointed out the world lead Canada had made in granting tax exemption to new mines for three years and now has the world's soundest currency, largely due to no capital gains taxation. Kelly said for the individual, "the taxpayer should have the right to deduct the expense of creative work."

Healthy Uranium Industry

Uranium mining has gotten off to a good start in northern New Mexico and the possibilities are also good for continuing development of new mines, according to J. B. Knaebel, manager, New Mexico operations for the Anaconda Copper Mining Company. He spoke with first-hand knowledge because Anaconda has built and has operated since June 9th an ore-buying station for uranium and vanadium for the United States Atomic Energy Commission at Bluewater, west of Grants. Anaconda is erecting, at Bluewater, a uranium leaching plant using its own funds for construction. Anaconda engineers and geologists have also mapped many deposits, conducted an active prospecting program, and test-mined several ore bodies to learn costs and more about mining of the highly irregular deposits. Many smaller companies and individuals are also producing uranium ore and the extensive exploration done by "Operation Haystack" of the Atchison Topeka and Santa Fe Railroad under the supervision of T. O. Evans has been "extensive and very effective in throwing more light on the nature of the deposits in the limestone," he reported.

Disseminated Copper Geology

Copper is of greatest importance of all minerals to the mining industry of the southwest. Copper is in short supply at the present time, and the mining companies are redoubling efforts to increase production and find new ore bodies. Thus, it was only natural that the conference hear L. K. Wilson, chief geologist, Southwestern Division, ASARCO, report on the mineralization at the developing Silver Bell open-pit mine north of Tucson. He reported that the limonitic standing of the outcrops was a clue to mineral structure. Two orebodies have been found in a major northwest striking fault zone and their positions localized by cross fracturing.

TOP LEFT: John B. Knaebel, manager, New Mexico Operations, Anaconda Copper Mining Company, Grants, New Mexico presented the first technical paper at the conference. His paper titled "Uranium Mining and Milling Developments in New Mexico" was illustrated by colored aerial pictures taken by the geologist-engineer-flyer. TOP RIGHT: New Mexico miners' new president, W. P. Morris, left, thanks J. J. O'Connell, Albuquerque for the fine Suppliers Party. O'Connell was chairman of the special committee that arranged the party. BOTTOM: Part of the record breaking crowd at the Southwest Mineral Conference. This photograph shows prominent southwest operators from Arizona, New Mexico, Texas, and other states at the luncheon at which Clinton P. Anderson, United States Senator from New Mexico spoke.

The search for new deposits is under way using every prospecting tool. Philip K. Laylander, consulting geologist, outlined his color photographic mapping from the known deposits to the search for the unknown. Degrees, and color of alterations as shown in the photographs, structural control, and geologic criteria form a new prospecting tool, he said.

Potash Developments

W. B. Dancy, development engineer, International Minerals and Chemical Corporation, Carlsbad, New Mexico reported that Lea County, New Mexico might be the scene of large-scale production of potash in the future. The five producing companies are all mining in Eddy County now. Agriculture has always been the largest consumer of potash salts, but International Minerals has embarked on a program for wider use of potash in the chemical industry.

Mineral Identification

The southwest is the locale of major deposits of such rare elements as beryllium, lithium, and boron, according to Dr. R. H. Jahns, Department of Geological Sciences, California Institute of Technology, Pasadena, California. In fact, he said, the elements are found in mineable concentrations which makes them appear common. This is fortunate for both the southwest and the nation. In addition, uranium and the rare earths have recently been found in mineable deposits to add to the southwest's mineral fame. Dr. Johns foresees a bright picture for additional rare mineral discoveries and production.

Officers For 1953

The final session of the conference featured the election of officers for the coming year for the New Mexico Mining Association. Those elected were: W. P. Morris, Duval Sulphur and Potash Company, president; Carl S. Elayer, Silver City mine operator, first vice president; and A. J. Thompson, mining department head of the New Mexico Institute of Mining and Technology, second vice president.

The Southwest International Mining Association will be host for the 1953 conference at El Paso, Texas. Ben D. Roberts, manager, American Smelting and Refining Co., El Paso, is president of the Southwest Association.

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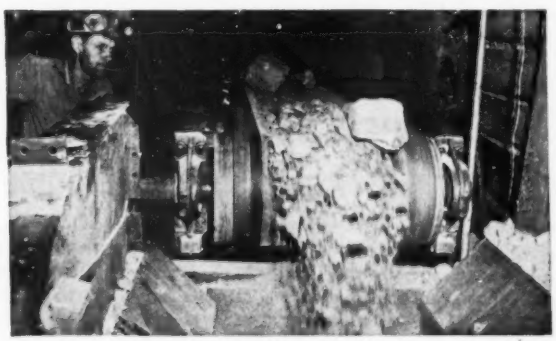
Conventional Methods Costly

A western copper mine operated three stopes by conventional methods in extremely heavy ground with rock highly altered and high moisture content. Ore moved from the stopes on short transfer raises, was bottomed in individual pony set chutes and drawn to haulage cars in a standard haulage drift.

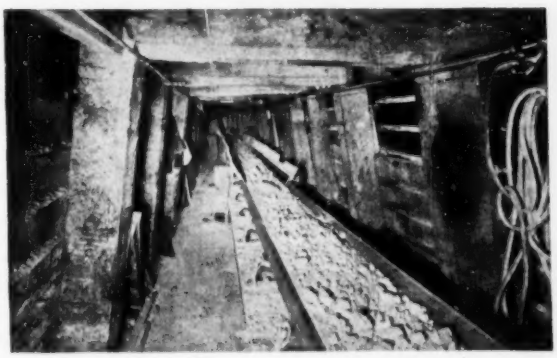
Results were not too good . . . costs were too high because of excessive weight conditions with track haulage. This method also limited the tonnage that could be drawn each 24 hours due chiefly to time out for haulage drift repairs. This, in turn, required that extraction openings be maintained at a high cost over too long a period.

The Hewitt-Robins Solution

To solve the problem, a 200-foot Hewitt-Robins Ore Mine Conveyor was installed as a lateral transfer unit in a sub-drift under the slusher and grizzly level.



The benefits were immediate. Faster, more uniform drawing was possible with less time exposure to excessive maintenance costs. And 1,400 to 1,600 tons/day were drawn compared with approximately 632 tons/day average in the best of the previous 3 stopes. Now, more blocks are being caved, using additional Hewitt-Robins Ore Mine Conveyors.



Simplifies Timber Repairs

Whereas timber repairs on the haulage levels formerly had to be done on a shift when the stope was down (because track operation interfered with repair crews) all necessary repair work in the conveyor drift can be done while ore is moving and the stopes are in full operation.

Simpler, faster train cycle operation is also possible. No longer is there the need to shop around from 4 pony set chutes to load out a 25-car train . . . haulage cars are loaded at the discharge end of the conveyor.

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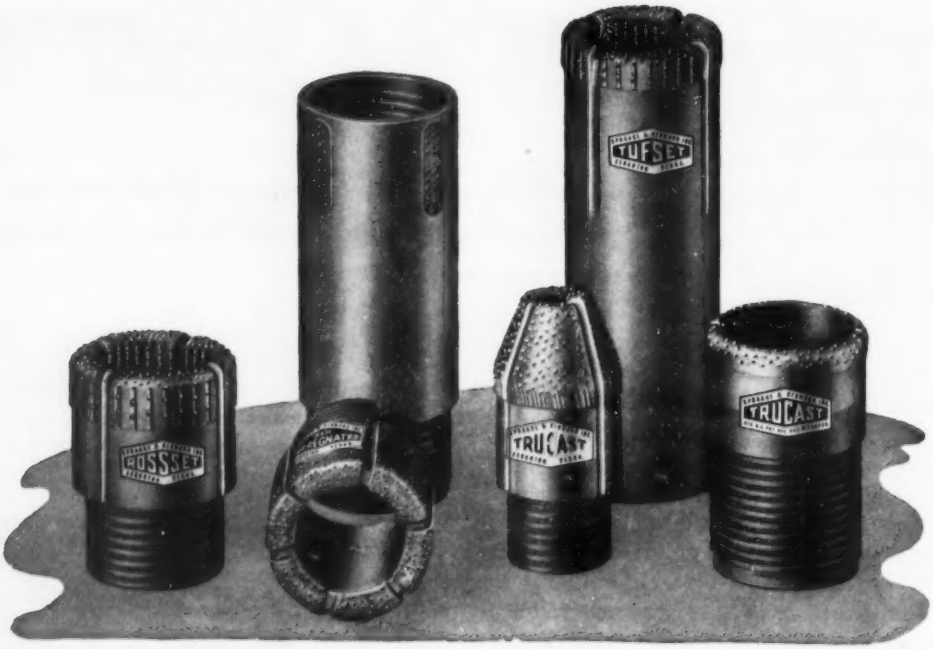

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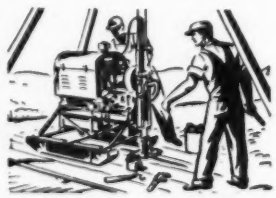

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ACTIVITIES OF U. S. MINING MEN

RICHARD S. NEWLIN has been elected vice president in charge of mining operations for Anaconda Copper Mining Company succeeding Clyde E. Weed who was recently elected vice president in charge of operations of the company and its subsidiaries. Mr. Newlin was assistant vice president in charge of mining operations before this new appointment. He has been with Anaconda and its subsidiaries for many years. He was assistant mine superintendent of Andes Copper Mining Company at Porterillos, Chile, and left Inspiration Consolidated Copper Company at Inspiration, Arizona, to come to the New York office of Anaconda in 1942.

F. V. Richard, manager of the southwestern division, western mining department, American Smelting and Refining Company, is scheduled to succeed **J. Fred Johnson** as manager of operations, western mining department, Salt Lake City. Mr. Richard will transfer from the Tucson, Arizona office when Mr. Johnson retires on January 1, 1953. Other promotions within ASARCO's mining department brought about by the change include: **T. A. Snedden** to manager, southwestern division, from superintendent, Silver Bell, Arizona unit; **D. R. Purvis** from superintendent, Ground Hog-Deming unit, Vanadium, New Mexico to succeed Mr. Snedden; **W. C. Waidler** from superintendent, Trench unit, Patagonia, Arizona to superintendent at Ground Hog-Deming; and **D. R. Jameson** from mine superintendent, Ground Hog, to succeed Mr. Waidler.

Frank R. Milliken has been appointed a vice president of Kennecott Copper Corporation and will supervise the company's mining operations in this country and Chile. Mr. Milliken formerly was assistant manager of the Titanium Division of the National Lead Company. Other Kennecott advancements are: **Dr. Leslie G. Jenness** to vice president in charge of research; **J. P. Caulfield** to assistant general manager, western mining divisions; and **L. F. Pett** to general manager, Utah Copper Corporation.

William R. Ryan, supervisor of personnel for the Oliver Iron Mining Company in Duluth, Minnesota since 1938, has retired. He had been with the company for 39 years, starting as chief clerk in the Duluth office in 1913. **John Steinke,** Oliver's superintendent of timber lands, has also retired. He started as a timber cruiser with the company in 1910, and has been camp foreman, chief estimator, and assistant superintendent. He became head of the department in 1946, and during his stay there practiced the selective cutting of mature timber on Oliver holdings from which timber for underground mining is obtained. Mr. Steinke will be succeeded by **Maurice R. Schaller. T. G. Roy,** consulting engineer on the Gogebic range, has also retired after 24 years of service.

W. Church Holmes has rejoined Idaho's Sunshine Mining Company and will be in charge of new projects. He will make his headquarters in Spokane, Washington. Mr. Holmes was with Sunshine from 1935 to 1947, holding the positions of mill superintendent, chief metallurgist, and manager of the rare metals division. He has since been with Nichols Engineering and Research Corporation and with Fluor Corporation.

Rear Admiral Paul L. Mather (U.S. Navy, Retired) has been appointed head of the Defense Materials Procurement Agency's Region IV office in Singapore. Admiral Mather will be in charge of DMPA activities in Afghanistan, Pakistan, India, Southeast Asia, the Philippines, Indonesia, Japan, Australia and New Zealand. He may also take charge of the General Services Administration activities in the Far East. The DMPA has two other foreign offices, one in Lima and another in London.

J. THAD WATTERS is the new works manager of Alcoa Mining Company's operations at Bauxite, Arkansas, succeeding Luther R. Branting, who has retired. Mr. Watters has been with Alcoa since 1923. He has done exploratory and construction work in Surinam, and was operating manager of Alcoa's Paranam plant there. He has been general operating foreman at Bauxite, and, since March of this year, has been assistant works manager.

R. R. Trengrove, mining engineer, is stationed at Reno, Nevada with the U. S. Bureau of Mines. He formerly was located on the Mesabi range.

C. W. Engelhard was recently appointed director of Transvaal Gold Mining Estates, Union of South Africa. Mr. Engelhard is also president of Baker and Company, an American firm which deals with precious metals on an international scale.

R. S. Walker and **Fred Vines,** chief engineer and assistant chief engineer, respectively, of the M. A. Hanna Company at Cleveland, Ohio, have completed an inspection trip to the Labrador iron ore district. **Chester Place,** another Hanna employee, has been promoted to pit foreman at the Perry mine in Minnesota. **James Clemens** has rejoined the M. A. Hanna engineering staff at Iron River, Michigan after two years in the Rocky Mountain states. When previously employed by the Hanna Company, he was safety engineer and operating engineer at the Homer mine.

Francis O. Case, vice president and member of the board of directors of

R. E. NELSON, former assistant to the president of American Gilsonite Company, has been appointed production manager. Mr. Nelson has been with American Gilsonite since 1948 when he left the Standard Oil Company of California to join this organization. He and J. H. Baker, superintendent of the company's mines near Bonanza, Utah, developed the new product "Gilsulate" which is being distributed to national and foreign markets.

Anaconda Copper Mining Company, has been elected president of Anaconda Aluminum Company, a subsidiary formed in connection with a new $45,000,000 aluminum project near Columbia Falls, Montana. Mr. Case, a chemical engineer, will be in charge of a plant with a capacity of 50,000 tons a year. The plant should be completed early in 1954, and production should begin shortly thereafter.

Richard W. Flagg has joined the research department of Dorr Company, Westport, Connecticut. Mr. Flagg took his degree in metallurgy from the University of Arizona and has been employed in the research laboratory of the Miami Copper Company, Miami, Arizona.

Max M. DuBois is the new assistant to the manager of U.S. Smelting, Refining and Mining Company's western mines. Mr. DuBois, formerly general superintendent of the U.S. and Lark mine, succeeds **J. M. Ehrhorn,** who is being assigned to special work with the company's western operations. **Benton Boyd,** superintendent of the Lark section, succeeds Mr. DuBois as general superintendent of the U.S. and Lark mine; **Harold Wells,** assistant superintendent of the Lark section, has been promoted to superintendent; and **Clyde Gillam,** engineer, has moved up to assistant superintendent.

H. A. Doerner, metallurgist at the Albany, New York office of the U.S. Bureau of Mines, has accepted a position as metallurgist with the American Chrome Company at Mouat, Montana.

MARTIN FITZIMMONS has been named general manager of Cyanamid de Mexico, a subsidiary of the American Cyanamid Company. He will be in charge of the company's sales of chemicals for the mining industry. Most recently, Mr. Fitzimmons has been with American Cyanamid's research laboratories at Stamford, Connecticut, as a mining engineer. Earlier, he had been assistant superintendent of the South American Development Company in Ecuador. He has also been active in general mining operations in California.

R. M. Hardy of Yakima and Seattle, Washington, is president-elect of the western division, American Mining Congress. Mr. Hardy is also president of the Sunshine Mining Company, an Idaho firm.

Justin B. Gowen is new deputy director of the Domestic Expansion Division, Defense Materials Procurement Agency. He succeeds **Weston Bourret**, who is returning to California to join the staff of the Utah Construction Company as a geologist. Mr. Gowen has been with the DMPA since its beginning, and previous to that was employed by the Anaconda Copper Company for 24 years.

Obituaries

McHenry Moiser, 67, chief of the eighth region mining branch of the U.S. Bureau of Mines, died in Bethesda Maryland, on October 19. Mr. Moiser had been associated with the Phelps Dodge Corporation for 26 years before going to Washington, D.C., to join the bureau.

William J. Loring, 84, nationally known mining engineer, died in Tonopah, Nevada, October 8. Mr. Loring had been prominently identified with mining for more than half a century. He was at one time associated with Ex-President Herbert Hoover in the ownership of the firm of Bewick Moreing & Co. He was responsible for developing the first rapid crushing of ores by stamp mills, and started numerous operations of great importance to the mining industry, including the Burma Corporation in Burma. His mining trips took him all over the world to such places as Australia, England, Japan, Korea, China, and India. He was associated with mining properties in the United States; in California he was president and managing director of the Carson Hill Gold Mines, Inc. His last attempts had been to reactivate the Belmont mine at Tonopah.

Irving E. Rockwell, 89, elder statesman of Idaho mining, died in Bellevue, Idaho, September 23. Mr. Rockwell's long and colorful career, ranging from Budapest to Boise, brought him into contact with most of the prominent mining men of the era, including the late Senator W. E. Borah and Herbert Hoover. His connection with Idaho mining began when he started work on the famous Minnie Moore mine, from which millions in lead-silver were extracted.

Homer McCarty, 84, mining engineer and a founder of the potash industry near Marysvale, Piute County, Utah, died in Salt Lake on September 12. Mr. McCarty was instrumental in organizing the Aluminum Potash Company of America. He was county surveyor of Sevier County, and later U.S. mineral surveyor and U.S. cadastral engineer in the same region.

Daniel M. Kelly, 72, retired vice president in charge of western operations for the Anaconda Copper Mining Company and former attorney general of Montana, died at Butte on September 24.

Fred H. Haggerson, 68, chairman of the board of Union Carbide and Carbon Corporation, died in New York October 14. Mr. Haggerson had been with Union Carbide for over 33 years. He was made a vice president in 1938, a director in 1941, and president and a member of the executive committee in 1944. He became chairman of the board in 1951.

Dr. Hans Merensky, 81, one of South Africa's greatest and richest geologists, died in Diuwelskloof, South Africa, on October 21. In 1927, Dr. Merensky discovered a huge diamond field near Alexander Bay on the West Coast of South Africa. He eventually sold his interest in the area for $5,000,000. Three years previously he had discovered the Merensky platinum reef in the Lydenberg district of the Transvaal, the first platinum ever found in reef formation in payable quantities.

Henry Morris Hartmann, 64, prominent mining engineer, died in Salt Lake in August. Well-known in western mining, Mr. Hartmann entered the field with Senator W. A. Clark and was associated with the Clark enterprises for 20 years. He joined the International Smelting and Refining Company in 1935. For them, he helped in the development of the Silver Peak and Bunkerville properties in Nevada, and managed the Yellow Jacket near Salmon, Idaho, and Mountain City Copper Company holdings at Mountain City, Nevada. Between 1939 and 1942 he was manager of the Walker Copper Company, also an IS&R subsidiary, in California.

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SINCE 1915 — PIONEERS IN HAULAGE EQUIPMENT

ACTIVITIES OF INTERNATIONAL MINING MEN

R. R. NELLER has resigned from his position as spectrographer with The Electrolytic Refining and Smelting Company of Australia Pty. Ltd. in New South Wales, Australia, to take up duties as chief chemist with Mufulira Copper Mines, Ltd. in Northern Rhodesia.

Nai Pathom Gajaseni, director-general of mines, and **Priyabacanaphabung Chakradbandh**, director of the inspection division, Thailand Department of Mines, recently visited Australia to study the lead-zinc industry and to observe the processing of brown coal at Yallourn, Victoria.

J. J. De Witte has been appointed exploration director of the Societe de Recherches et d'Exploitation Diamantiferes in French Equatorial Africa. Mr. De Witte has also worked in French Morocco, Holland and Indonesia.

Dr. J. M. Harrison, staff member of the Geological Survey of Canada, was Canada's official delegate to the International Geologic Congress held recently in Algiers, Algeria. He was accompanied by **Dr. M. Hurst**, Ontario provincial geologist; **I. W. Jones**, Quebec provincial geologist; and **F. Henderson** and **C. Riley** of Vancouver, B. C. Dr. Harrison addressed the assemblage on the Labrador iron ore Trough.

Bjorn Wickbom has been appointed managing director of the AB Statsgruvor (State Mining Company) in Sweden. Mr. Wickbom, a mining engineer, will succeed **H. Hennemann** when the latter retires in 1953.

Three South African scientists—**Basil Van Bergen, Gustav Preller** and **David du Plessis**—are in Golden, Colorado working on a process to remove phosphate from raw ore. They brought with them 90 tons of South African ore for use in experiments at the Colorado School of Mines Research Foundation, and are attempting to develop a large-scale application of the froth-flotation process for use by their firm, The Phosphate Development Corporation of South Africa.

THOMAS A. CAMPBELL, formerly vice president and managing director of the Chilean subsidiaries of the Anaconda Copper Mining Company, has been elected executive vice president succeeding Burr Wheeler who is retiring after 38 years of service. RODOLFO MICHELS, vice president of Andes Copper Mining Company at Porterillos, Chile, and Chile Exploration Company at Chuquicamata, Chile, has been elected vice president and resident director of these companies with headquarters at Santiago, Chile.

Shri S. K. Barooh is now director of mines and geology at Nagpur, Central Provinces, India. He previously was located in Jodhpur.

D. T. Mitchell is general mine superintendent and **George R. Muskett** mill superintendent of the Associated Mining Companies in the Fiji Islands. **E. E. Wallace** is mine superintendent for the Emperor Gold Mining Company, Ltd., and **J. Cramer-Roberts** holds the same position at Loloma (Fiji) Gold Mines, N. L. and for Dolphin Mines Ltd. The three firms comprise the Associated Mining Companies.

Niels August Nielsen is a new mechanical engineer for Skanska Cement A/B in Koping, Sweden. Mr. Nielsen formerly held the same position at Kjorholt Kalkstensbked in Herstad, Norway.

A. J. Keast is now affiliated with the Australian Aluminum Production Commission at Bell Bay, Tasmania. He formerly was general manager at Zinc Corporation, Ltd., in Melbourne, Australia.

New mining engineer with the EKI Coal Company in Zonguladak, Turkey, is **Nejad S. Oklar**. Mr. Oklar previously worked in Soma, Turkey.

P. R. Maclachlan of Glasgow, Scotland, has added a "Senor Don" to his name and has gone to work for La Compania de Azufre y Cobre de Tharsis Ltda., in Huelva, Spain.

John F. Price, Jr., mining engineer, has moved from Monclova, Coahuila, Mexico, to Monterrey, N. L.

F. H. Saniter, director of research for the United Steel Companies, Ltd., in England, has moved to the company's new laboratories located at Swinden House, Moorgate, Rotherham, England. Mr. Saniter formerly was located in United Steel's central research laboratories in Stocksbridge near Sheffield.

J. C. Kidd is new blast furnace superintendent for Rhodesia Broken Hill Development Company, Pty., Ltd., in Broken Hill, Northern Rhodesia. He previously was affiliated with Broken Hill Associated Smelters, Pty., Ltd., in Port Pirie, South Australia.

Sherman Tough is engineer-in-charge of two diamond drilling operations for pyrite for the Freeport Sulphur Company. One operation is located 30 miles north of Steep Rock Lake, and the other is near Beardmore. Both towns are in Ontario, Canada.

W. J. Marshall is mine superintendent for the Hallnor Mines, Ltd., in Pamour, Ontario.

Sten Vestergren is mine engineer for Stallbergs Grufveaktiebolag in Ludvika, Sweden. He formerly was employed in the same capacity by the Luossavaara-Kiirunavaara Company in Kiruna, Sweden.

Sven Sjoberg, chief engineer for Stora Kopparbergs Bergslags Aktiebolag, has moved from the Tuna Hasterg, Sweden, operations to those at Falun. **Lars Olof Vallfors**, mining engineer, has transferred from the Falun works to Vintjarn, Sweden. **Per Adolf Geijer**, engineer, has left the firm and is now employed by Domnarvets Jernverk in Domnarvet, Sweden.

NILS E. NILSEN, chief general manager of the Associated Mining Companies in the Fiji Islands, has been in the United States in connection with the exploration program recently announced by the combined mining companies in Vatukoula gold-field, Fiji. The Associated Mining Companies include Emperor Gold Mining Companies, Ltd., Loloma (Fiji) Gold Mines N. L., and Dolphin Mines Limited. Mr. Nilsen is also a director of the Great Boulder Pty, Gold Mines Limited in West Australia, and King Island Scheelite (1947) Limited on King Island, Tasmania.

Stig Rahm has moved from the Stockholm office of Trafikaktiebulaget Grangesberg-Oxelosund to the Grangesberg operations.

L. Mayger is now assistant plant superintendent for Macalder-Nyanza Mines, Ltd. at Kisumu, Kenya, East Africa. He was formerly with Zinc Corporation Ltd. at Broken Hill, New South Wales, Australia.

D. M. Williams is now employed by the Consolidated Mining and Smelting Company at Kimerbly, British Columbia, Canada. He had been with the Taquah & Abosso Mines, Ltd. at Abosso, Gold Coast, British West Africa, before making this change.

Douglas F. Ainge has left New Zealand and is now with the Burma Corporation (1951) Ltd. in Rangoon, Burma.

John Ghosh, director of the Geological Survey of India, was a recent visitor at the Mesabi iron range in Minnesota. **A. Royden Harrison**, consulting engineer with Anglo-American Corporation, Johannesburg, South Africa, made the same tour.

Daniel P. Hatch has been elected vice president and a director of Siscoe Vermiculite Mines Ltd., a wholly-owned subsidiary of Siscoe Gold Mines, Ltd., Montreal, Canada. Mr. Hatch is a retired vice president of Building Products, Ltd. and former president of the Canadian Exporters' Association.

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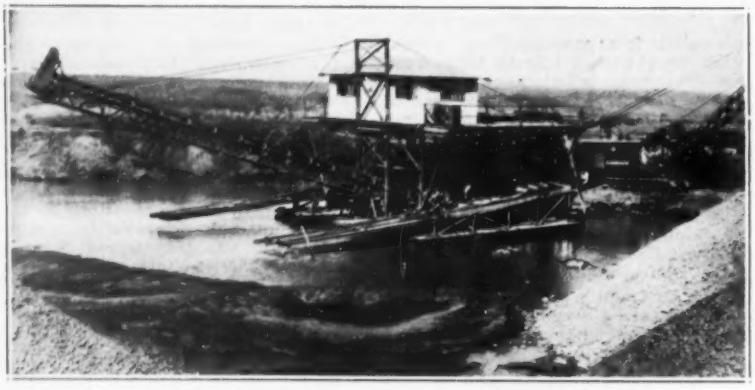

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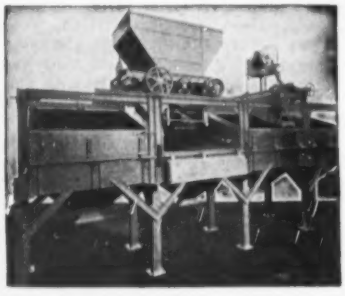

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INTERNATIONAL NEWS

J-M Has Interest In New Colombian Asbestos Firm

A new company, Asbestos Colombianos, S.A., has been formed to explore asbestos deposits in the Department of Antioquia, Colombia. Partners in the venture are Johns-Manville Corporation, Eternit Colombiana, S.A., Sociedad Colombiana de Asbestos, Ltda., and the Institute de Fomento Industrial, an organization of the Colombian government devoted to promoting the industrial development of the country.

Johns-Manville will supply the technical personnel to explore the deposits and to evaluate their economic worth. If results are favorable, J-M may design a mill and other production facilities; and may also provide research facilities at Manville, New Jersey for testing, grading, and assaying the asbestos fiber produced by the new company.

Canadian Firm To Supply Nickel To United States

The Defense Materials Procurement Agency has signed another agreement with a Canadian nickel firm to supply vitally needed nickel to U.S. stockpiles. The new contract, signed with Milnet Mines, Ltd. and Falconbridge Nickel Mines, Ltd., both of Toronto, is similar to the one negotiated recently with Falconbridge and East Rim Nickel Mines, Ltd.

Milnet will begin to mine ore from its properties in the Sudbury district of Ontario not later than March 1, 1953, and will produce ore at an average of 2,100 short tons per week until the end of 1954. Falconbridge will process the ore at its facilities in Ontario and in Norway.

DMPA will assist Milnet by advancing $440,000 repayable with interest as production increases. Total cost of the project is estimated at $950,000. The Agency has agreed to purchase 4,104,000 pounds of nickel, and such platinum and palladium as are found in the ore.

Uis Tin Redesigns Mill To Increase Capacity

The Uis Tin Mining Company (South West Africa) Limited will spend £60,000 during the coming year to redesign the concentration section and to increase mechanization at its new mill.

The results of large-scale tests showed that the original design of the concentrate section would not have been satisfactory, and, consequently, that portion of the new mill will now include a ball mill regrind circuit and Humphrey's spirals, in addition to jigs, as concentrating units.

Company directors expect that trial runs will be made in a portion, if not the entire new plant before the end of the year. The crushing section was scheduled for completion at the end of October. The main drawings of the redesigned concentration section have been completed and the concrete work for this structure is under contract. The capacity of the new plant will be 1,000 tons per day.

According to reports, the faces of the large tin-bearing pegmatite bodies in the area which have been opened to date are already sufficient to ensure a continuous supply of ore to the new plant. Prospecting and development work on the smaller irregular bodies has not yet been resumed, but detailed geological mapping of the mining areas is still being carried out.

Syndicate Will Explore Newfoundland's Resources

A specially-formed syndicate, headed by the British banking house of N. M. Rothschild and Sons, is preparing to spend $6,000,000 to explore the natural resources of Newfoundland. Advance teams are already in that country making aerial surveys, and extension of the investigation will depend upon the outcome of their reports.

Companies cooperating with Rothschild include: The Anglo-American Corporation of South Africa, the English Electric Company, the Anglo-Newfoundland Development Company, the Rio Tinto Mining Company, and the Bowater Paper Corporation and its Newfoundland subsidiary.

According to reports, the move is the result of efforts expended by Newfoundland's Prime Minister Joseph Smallwood, who told the businessmen and industrialists that there are large proven bodies of high-grade iron ore, plus manganese, zinc, and titanium. He also said that power was cheap and pulpwood plentiful.

If the development is carried out, it is estimated that a total of $500,000,000 will be needed. The Newfoundland government itself in 1950 spent several months surveying 5,000 square miles of territory in the central-northern part of the country. At present, a combination of six American steel companies have invested more than $70,000,000 to open up iron ore deposits.

Eight New Uranium Mills To Give S. Africa World Lead

An additional eight South African gold mines will recover uranium from treatment of cyanide plant slimes. This brings to 13 the number of gold mines to yield byproduct uranium. The eight mines have signed 10-year purchase agreements with the Atomic Energy Board of South Africa for the sale of all uranium from the time of initial plant operations. In most instances the companies have arranged to secure loans from the Board to finance byproduct plant construction.

The price payable for the uranium production will be related to production cost on a basis that will repay each construction loan plus interest, and should provide a reasonable margin of profit.

Two of the new producers are on the West Rand: Luipaard's Vlei Estate and Gold Mining Co. Ltd., and the Randfontein Estates Gold Mining Co., Witwatersrand, Ltd. Six in the Orange Free State are: Free State Geduld Mines, Ltd., President Brand Gold Mining Co., Ltd., President Steyn Gold Mining Co., Ltd., Welkom Gold Mining Co., Ltd., Western Holdings Ltd, and the Virginia Orange Free State Gold Mining Co., Ltd. (Kennecott Copper Corporation financing in part).

Increased uranium production will be achieved as follows by each company. Randfontein will shift mining to the Bird Reef conglomerate which has a higher-than-average uranium content. A new plant scheduled for 1954 production will be built. Luipaards will increase production and enlarge its crushing plant by 30,000 tons monthly, most increase to be from the Bird Reef. The new slime treatment plant should be in operation in 1954.

Virginia will build a new byproduct plant adjacent to its gold plant with first uranium recovery set for 1955. The other five Orange Free State mines, all managed by Anglo American Corporation of South Africa, Ltd., will build two 100,000-ton-per-month leaching plants to treat byproduct slimes from the five gold mills. One will be in production late in 1954 and the other several months later. Both will be erected near the new city of Welkom, one at President Steyn and the other at Welkom Gold.

Bolivian Tin Producer To Close Down Operations

The Compania Minera Unificada Cerro Potosi, one of Bolivia's largest tin producers with mines and plants at Potosi, has announced that it will cease mining operations as of December 22 because it finds it "impossible to carry on in the present conditions governing foreign exchange and in view of the company's numerous obligations."

The firm is a subsidiary of Mauricio Hochschild S.A.M.I., one of the three large tin mining concerns threatened by the government's nationalization plans. In February it was the second largest tin producer in Bolivia with an output of 204,465 kilograms of tin out of a national total of 1,491,133 kilograms. March production of the company was 197,684 kilograms; April, 191,291; May, 159,314; June, 208,313; and July, 183,233 kilograms. The national total for July was 2,761,288. During those last two months, the firm had dropped to sixth position in tin production. The company also produces copper.

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OCEANIA

PHILIPPINE ISLANDS—The Pesos 4.00 minimum wage law has been made effective for the mining industry by a recent decision of Secretary of Labor Figueras agreed to by the mining wage board. In turning down the mining operators, petition for a six-month delay, the Secretary said that if any relief were sought for the industry, it should come from sources other than labor. He said that the wages of the workers were not even enough to maintain them and their families in health and efficiency. The mine operators have received some relief from the situation in the action of the monetary board of the Central Bank. The board has granted the request of the Philippine Gold Miners Association that it be allowed to sell its gold in the open market instead of selling 25 percent of it to the Central Bank at the official price of $35 per ounce.

WESTERN AUSTRALIA—An agreement has reportedly been signed by the Western Australian government and *Broken Hill Proprietary Ltd.* for the establishment of a steel rolling mill near Fremantle. Other details are not known but when negotiations were started earlier in the year there were reports that Broken Hill would obtain a long lease covering the iron ore deposits on Koolan Island in Yampi Sound. The company is also to investigate the possibility of using coal from Western Australia in steel making. This could lead to development of a large-scale steel industry in the state.

PHILIPPINE ISLANDS—The *Gabun-Paracle Mining Company, Inc.* has won the bid to supply the Chinese Nationalist Government on Formosa with 8,000 metric tons of iron ore. Gabun-Paracle was the only Filipino firm to enter the bidding. Last year, it signed a contract to supply iron to three big iron mills in Japan: the *Yawata Iron Steel Company, Fuji Iron & Steel Company, Inc.*, and the *Nippon Steel Tube Company Ltd.* To date, Pesos 146,000 worth of iron ore has been shipped to those mills, and about Pesos 1,000,000 worth is scheduled for future shipment.

QUEENSLAND—Australian tin production continues downward but may be almost doubled within two or three years if projects in the Mount Garnet area come to fruition. *Tableand Tin N.L.* is transferring its dredge to Smiths Creek, while *Ravenshoe Tin Dredging Ltd.* is planning to install a dredge in the Bettle-Battle Creek area.

INDONESIA—*Bengkalis Gold Dredging Company* will resume work at its concessions in East Sumatra. The company plant was damaged but not as extensively as originally expected and the government has promised to assist in its restoration.

NEW SOUTH WALES—*Tungsten Consolidated Ltd.* has started production at the *Frogmore* mine. The firm has also exercised its option on the Rye Park area and has formed *Rye Park Scheelite N.L.* to work the property. The deposits are reported to contain tungsten, molybdemum, magnetite, and fluorite. Reserves are estimated at 82,500 tons.

INDONESIA—The State Mining Commission is reported to be preparing a

draft of a new mining law. Among the issues being considered in writing the new law are the following: the nationality of the mining companies; the question of who owns the mineral deposits; the division of profits between government and company; how to settle disputes, such as right of ownership of the property; and regulations concerning the operation of the firms.

NEW GUINEA—During September, *New Guinea Goldfields, Ltd.* treated 2,588 tons of ore at its new Golden Ridges mill. From this, 1,246 ounces of gold bullion were recovered.

NORTHERN TERRITORY—*Peko (Tennant Creek) Gold Mines N.L.* continues to report good values in gold and copper at its mine in the Tennant Creek area. A connection between the 200 and 300 level, in ore, assayed 22 percent copper and 11.9 dwts. of gold. There has been much speculation on the stock exchange over the stocks of companies operating in this area, although deposits at Tennant Creek to date have generally been patchy and small.

PHILIPPINE ISLANDS—*Itogon Mining Company* has put its new gold refinery into operation. The company had previously shipped its gold-silver bullion, amounting annually to over 42,000 ounces to the United States for refining. The new plant is expected to save the company about Pesos 30,000 per year. Using the chlorine process, the molten gold which has been separated from the slag in the furnace, is poured into a large highly heated crucible instead of being poured into a mold to form the bullion. Chlorine gas (purchased in steel pressure tanks) is then fed into the molten gold through a clay tube. The silver unites with the chlorine to form silver chloride which rises and forms a scum on the surface. This is skimmed off and the silver recovered by the acid process. The lead, copper, and other base metals are driven off in a gaseous form, leaving the almost pure gold.

QUEENSLAND—*Mount Isa Mines Ltd.* produced 3,235 tons of silver-lead bullion and 3,866 tons of zinc concentrate during September. The copper concentrator is ready for production but several months' work on the smelter still remains.

PHILIPPINE ISLANDS—The new steel ingot mill of the *Marcelo Steel Corporation* is now in operation, one month ahead of schedule. The first and only one of its kind in the country, the unit is a part of the steel melting and rolling plant at Punta, Santa Ana, Manila. When in regular commercial production, together with the three electric arc furnaces and one re-rolling mill, the output of Marcelo steel is expected to reach 40,000 metric tons annually.

TASMANIA—The state's leading tin producer, *Aberfoyle Tin N.L.* at Rossarden, increased its annual profit by £A162,058 for the year ended June 30. The firm's profit was £A537,621. The output of *Renison Associated Tin Mines N.L.* remains low, at 3 to 4 tons monthly. Renison, located at Renison Bell, has a large low-grade orebody mined mostly by open pit. It may yet develop into an important field. In four weeks to September 20, *King Island Scheelite* reports that it treated 15,687 tons to recover 69.9 tons of tin concentrate.

VICTORIA—Melbourne interests have acquired an important holding in *Red Terror Gold Mines N.L.*, registered in Adelaide, South Australia. An option has been taken on three scheelite leases at Mosquito Creek in the Northern Territory.

PHILIPPINE ISLANDS—*Benguet Consolidated Mining Company* has produced and shipped more chrome-bearing ore from its *Consolidated Mines, Inc.* property this year than it did in 1950 and 1951. The company operates the property on a 50-50 profit sharing basis with Consolidated. A record monthly shipment of 47,500 tons of chrome ore was established in August, compared with 46,300 tons in July, and 45,300 tons in June. Shipments in 1951 averaged 24,963 tons a month, and in 1950 17,428 tons.

NORTHERN TERRITORY—The Rum Jungle uranium field has been declared a prohibited area by the Commonwealth government. This is the first time the government has invoked the Defense Act to protect uranium deposits. The *Zinc Corporation Ltd.* has agreed to undertake rapid development of the deposits on behalf of the Commonwealth government. The Commonwealth Bureau of Mineral Resources is making an intensive air and surface search for other uranium deposits. Scintillometers will be used at 500 and 1,000 feet and likely areas will be checked by flying at treetop level with radio-activity meters. J. White, discoverer of the Rum Jungle deposit, has to date received £A 8,000 reward for his find.

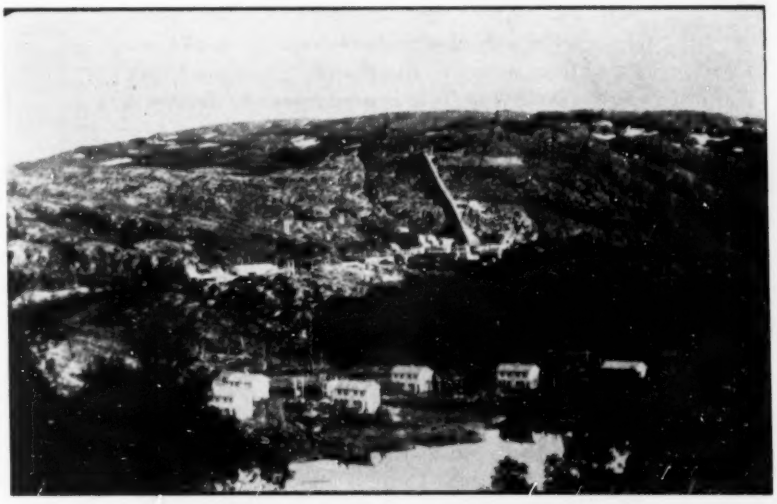
INDONESIA—An aluminum plant is planned for Sumatra with an annual capacity of 10,000 tons. The country has been exporting its bauxite. The plant will be set up in conjunction with a power installation on the Asahan River.

EUROPE

NORWAY—A niobium deposit has been located at Sove in Telemark, Norway. Arne Drogseth, director of *Norsk Bergverk A/S*, the government's mining corporation, states that a satisfactory method of processing the ore has now been perfected and that operations on an experimental scale will begin soon. A pilot plant is being established. It is intended provisionally to mine about 40,000 metric tons of ore, annually, and to produce about 150 tons of columbite concentrate with a 50 percent content.

THE NETHERLANDS—*Nederlandse Aardolie My*, the company formed by the *Standard Oil Company* and the *Royal Dutch Oil Company*, has applied for a concession covering 2,825 hectare near the town of Winschoten in the province of Groningen to explore for and develop anhydrite, rocksalt, and potash. The company has stressed in its application that it will transfer management to a third party interested in the treatment of these minerals, if necessary.

ITALY—Sulphur output in 1953 is expected to reach only 260,000 tons or 20,000 tons less than estimated in the program planned last February. Therefore, exports will be reduced from the estimated 90,000 to 80,000 tons. The decrease is attributed to the general gradual depletion of sulphur deposits, not fully compensated for by the increase in production which was expected when modernization of mining techniques was planned a couple of years ago.



PYRITE PRODUCTION FROM NORWAY

Production of pyrite-chalcopyrite at the rate of 150,000 metric tons a year has started at the Skorovass mines in northern Norway, operated by A/S Skorovass Gruber (Electrokjemisk A/S). About 170 men will be employed at the operation (shown above), and nearly all of the output will be exported. The Norwegian government guaranteed a loan of £650,000 for the reconstruction of the mines after World War II. Norway's pyrite production last year totaled 700,000 tons; production from the Skorovass mines will help to raise this figure closer to the 1,000,000-ton mark which was the annual rate before the war.

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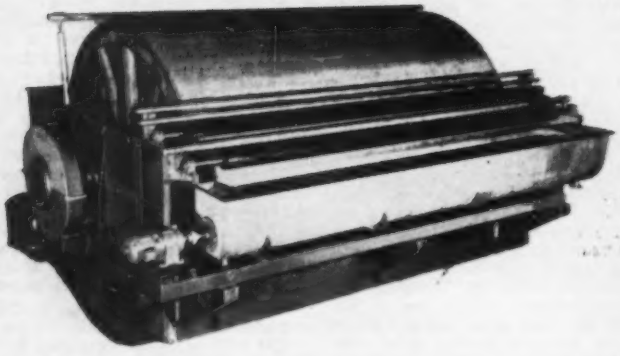

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ENGLAND—The government is reported to be listening sympathetically to the representatives of the Cornish tin mining industry in their requests for taxation concessions. The nationalization of the Bolivian industry and the uncertain conditions prevalent in Malaya have caused some concern in London about future supplies.

SWEDEN—Large deposits containing zinc have been found at a depth of 150 meters at Soderbarke in northern Sweden. The area will be investigated further by the Johnson concern at Avesta.

EAST GERMANY—Thuringia is reported to be the new source for uranium for the Soviet Union. The old uranium veins in the Erzgebirge Mountains adjoining Saxony are evidently being exhausted. The newly located deposits are said to be of higher grade, and larger tonnages are expected to be produced.

SPAIN—*Beralt Tin & Wolfram Ltd.* produced about 2,400 tons from its *Panasqueira* mine in Portugal for the year ended in March. In the previous 12 months it had produced only 1,760 tons. The company has a contract with the United States which guarantees a fixed price for the sale of about 2,500 tons of concentrate over the next five years.

CZECHOSLOVAKIA—More than 20 percent of the total working time at the *Pezinok* ore mines near Bratislava is lost because of uneven supply of electrical power and failure of machinery. It is reported that Pezinok's antimony and pyrite mines fulfilled only 34.2 percent of the government's antimony production plan, and only 64.2 percent of the plan for pyrite. The Bratislava electrical works often discontinue the supply of electric power without advance notice, and during the past five months caused the mine a loss of 369 man-hours of work. This amounts to 12.4 percent of the total work time of that period. An additional 10 percent was lost because of machinery breakdown and repair. Antimony output is now two-thirds short of the plan target, and pyrite about one-third below its target goal.

HUNGARY—While all required amounts of gypsum, talc, and fluorite have had to be imported up to now, the Hungarian economy has now started to mine and process these minerals domestically. Reports indicate that at the end of the current Five-Year Plan, the country will be able to meet all domestic requirements from within.

BULGARIA—Four major uranium mines, located near the villages of Buchovo, Kremikovzi, and Seslavkzi, are being operated by the government. These mines are named the *"1 May," "9 September," "Seslavkzi,"* and *"Goten-Mountain."* New excavations are being made every month, reaching to depths of 200 meters. Soviet engineers reportedly direct the work with a military work brigade of 600 men. Only about 150 civilians from the nearby villages are employed. Soviet engineers divide the produced ore into several grades. The better grade is shipped to the USSR from the railroad station of Jana. The lower grade is brought to a processing plant near Buchovo where the ore is cleaned and sorted before shipment to the Soviet Union.

ITALY—The Mutual Security Agency has approved financing of new equipment for a new zinc galvanizing line to be installed by the *Finsider Steel Company* at its works in Cornigliano. The

equipment—a continuous "zinc grip" galvanizing line for coating steel sheets with zinc—is expected to save millions of pounds of critical metal and to reduce production costs of defense and civilian products. The $800,000 worth of equipment will be purchased in the United States; installation costs equivalent to $500,000 will be financed by the firm in lira currency.

SWEDEN—The old *Hakansboda* mine at Ramsberg in northern Sweden will be reopened after being closed 30 years. The mine contains mainly zinc and cobalt ore and is owned by the *Stora Kopparberga Bergslags*.

NORWAY—Good progress is being made on the construction of the large new aluminum plant at Sunndalsora in western Norway. The plant, estimated to cost about £12,500,000, will be financed largely by a loan from the Mutual Security Agency. It will be repaid in aluminum ingots when production starts. Output will be about 40,000 tons yearly or almost as much as the entire present aluminum production in Norway. Partial production may start late in 1954 and complete production in 1955.

SPAIN—A recently signed trade agreement provides for Spain to export iron ore and pyrite to Holland during the year ending June 1, 1953.

YUGOSLAVIA—Geologists of the Institute for Geologic Prospecting in Basnia and Hercegovina are reported to have discovered deposits of potassium sales at Majevica.

ITALY—It is reported that the Italian government may decide to sell 6,000 tons of lead which has been stockpiled since early in 1951. When the rumor was circulated that such lead would be dumped in the domestic market, domestic producers promptly reacted with the statement that they are now working at 50 percent of capacity and that they have very large stocks themselves. Since the lead was originally purchased abroad, the government has been urged to resell it on foreign markets. A large loss would probably be involved because the government purchased when higher prices prevailed.

SPAIN—Although normal mercury production from the government-owned cinnabar mines in Almaden is about 82,000 flasks, production in 1951 only totaled 27,000 flasks because furnaces were undergoing repairs. The processing equipment has a capacity of 600 flasks a day, and it is the demand abroad which regulates the amount that the plant will actually produce. At present, three veins are under development, and work has reached the 600-meter depth.

YUGOSLAVIA—Plans are to produce 22,500 tons of crude aluminum annually by 1954, and to increase this to 37,500 tons by 1956. Rolled products whose output is now about zero expect to increase in the same years to 18,000 tons and 23,000 tons. By 1956, the government hopes to have available for export some 13,000 tons of rolled metal and 14,500 tons of ingots. This will be accomplished by the completion of a new smelting plant at Strmisce (Slovenia); an electrolysis plant and rolling mill at Razine; and the conversion of a rolling mill at Slevenska Bistrica to produce aluminum. All of these plants are already under construction. The government claims that adequate supplies of bauxite and coal are available, and that the problems connected with rail transportation and supply of electricity are almost solved. It is expected that the Yugoslavian production of bauxite, which is merely a matter of providing machinery and trucks, will be raised by 175,000 tons a year which would be sufficient. The country exported only 156 tons of aluminum in 1951, mainly scrap.

NORWAY—A satisfactory method of processing niobium ore discovered in Telemark, northern Norway, has been reported by the director of the *Norsk Bergwerk A.S.*, the government mining corporation. A pilot plant is under construction and extraction will be at the rate of 40,000 tons of ore per annum, yielding 150 tons of concentrates with a 50 percent metal content.

ITALY—The new electrolytic zinc refinery of *Soc. Anon. Piombo e Zinco* (*SAPEZ*) is reportedly in operation at Nossa.

LATIN AMERICA

MEXICO—With the permission of the Labor Ministry, *Cia. Minera Nacional*, S.A. will close down its *San Carlos* unit this month because of depletion of mineable ores.

VENEZUELA—About 9,000,000 cubic meters of sand and mud in the Orinoco and Macareo Rivers channels have been dredged by the *Orinoco Mining Company* (a subsidiary of the *U.S. Steel Company*). Completion is expected by the end of 1953 at a total cost of $24,000,000. Orinoco is obliged by contract to pay all costs toward upkeep of these waterways for the next 50 years.

ARGENTINA—In the province of San Juan, Department of Iglesia, *La Punilla* mining company has started successful production of tungsten from its *Arrequintin* mine. First production was sent to Chilecito.

SURINAM—A cinnabar deposit has been located in the district of Marowyne, about 25 kilometers from the Marowyne River. At Onoribo, test borings made in a bauxite deposit have proved that the reserves are larger than originally expected.

BRAZIL—According to the last estimations, the *Urucum* mines in the state of Mato Grosso contain about 34,000,000 metric tons of manganese ore, with an average content of 45.6 percent manganese.

MEXICO—Important titanium deposits near El Revolcadero Beach, 18 miles from Acapulco, will probably be developed by the Mexican government because the deposits are in a zone from which foreigners are excluded by law. The law forbids foreign development of any property in zones up to 30 miles from international borders and sea coasts. The *Tennessee Coal and Iron Company* reportedly is seeking concessions to operate these deposits. Titanium is also one of the minerals, like uranium, which by presidential decree is regarded as national patrimony.

VENEZUELA—During the first six months of 1952, 919,987 tons of iron ore

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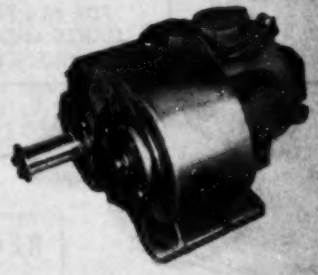

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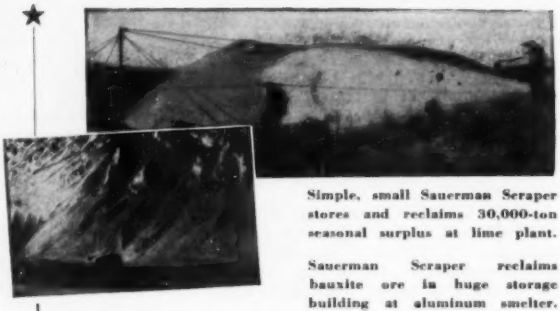

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were mined at the *El Pao* mines operated by the *Iron Mines Company of Venezuela*, a subsidiary of *Bethlehem Steel Corporation*. For the same period last year, only 534,779 tons were produced. The ore is transported by train to the Orinoco River port of Palua. From here it goes down river in barges to Puerto Hierro where it is transferred to ocean-going vessels for shipment to Sparrows Point near Baltimore, Maryland.

NICARAGUA—Old workings at the *Rosita* copper mine have been cleaned out and sampled. Laboratory tests are now being made to determine whether it will be possible to mine the property profitably. *Tonopah Mining Company* of Nevada holds a 40 percent interest in *Tonopah Nicaragua Company* which, in turn, owns the Rosita.

MEXICO—Despite protests of the mining industry, increased rail freight rates have been approved. The Mining Chamber says that this will probably curtail exports because of the extra expense involved in the long hauls which are necessary for shipment. According to the Chamber, the mining industry contributes much to the revenue of the government-controlled National Railways, Mexico's only railway. The higher shipping rates coupled with the lower prices for most exported mining products will serve to further depress the mining industry. National Railways argues that the road has been operating in the red for some time and must have more income to improve and maintain service. The new rates are expected to yield about $18,400,000 yearly, $6,900,000 of which will go for wage increases for the railroad men.

CHILE—Chile is second only to Brazil in the production of iron and steel in Latin America. The *Huachipato* plant will have an annual capacity of 350,000 metric tons, and will produce not only for domestic consumption but also for export.

ARGENTINA—Geologists have completed a survey of the *General San Martin* lead mine on the Eastern slope of Sierra Grande in Cordoba province. Some lodes are said to have ore assaying 48 percent Pb with widths of 50 centimeters, and 30 percent Pb with widths of 70 centimeters. A complete exploration program is being planned.

BRAZIL—*Companhia Brasileira de Aluminio* expects to be producing 10,000 metric tons of aluminum annually from its plant in the state of Sao Paulo beginning in 1954. Present Brazilian consumption is about 12,000 metric tons annually. From 1954 on, the company's production is expected to be as follows: in 1957, 15,000 tons; in 1960, 20,000 tons; 1962, 25,000 tons; and in 1965, 50,000 tons. The plant covers an area of 50,000 square meters. It is said to be one of the most modern in the world. It will be operated by 1,000 men, while a similar plant in Italy employs 2,900 workers. Initially, the plant will have 80 furnaces; these will be increased gradually to 162 units in order to meet the eventual production goal of 10,000 metric tons. The "aluminum sheet" production will be regulated by laminators which will produce two tons in eight hours.

ARGENTINA—The search for tungsten is being intensified as the world demand increases. Several promising prospects are reported in the provinces of Cordoba, San Luis, Mendoza, and San Juan. The most important and best equipped mine is *Los Condores* in San Luis province discovered in 1897. During 1941 it supplied 61 percent of the national output. In 1943 a 30-ton-per-day mill was installed which was worked until 1949. Average grade of concentrate was 66 percent WO_3. Preparations are now under way to increase production. The *El Aguila* mine is located within the same mining district. Combined output from the two has been close to 400 tons per year of tungsten concentrate and 14 tons per year of bismuth concentrate.

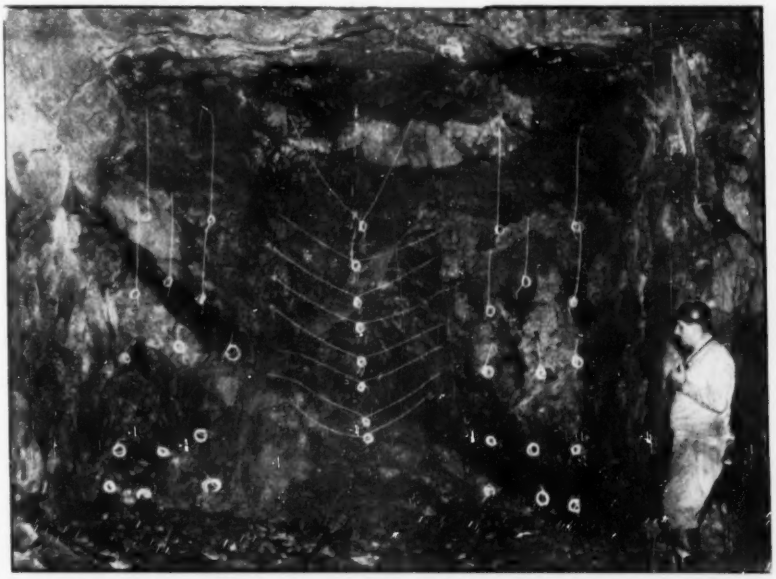
CUBA—*Transcontinental Resources* is considering methods of financing production at the *Isle of Pines Mining Company* gold mine which it is operating. An estimated $300,000 is needed to complete the development program. Plans call for deepening of the main shaft an additional 175 feet and establishing one level at the 600-foot horizon. Development will also be completed on the 300 level, and two new levels will be opened at the 45-foot and 600-foot horizons.

SOUTH AFRICA—The *Tsumeb Corporation*, which produces lead, zinc, and copper concentrates, is erecting a mechanical loading plant at Walvis Bay. The plant is already on the site and should be operating early in 1953. This will facilitate quicker loading and a faster turn-around of ships. The new vertical shaft at the Tsumeb mine was recently reported to have reached a depth of 2,965 feet. Sinking operations have been retarded by inflows of water from fissures in the dolomite. These inflows are being countered by suitable measures.

NIGERIA—*London Tin Corporation, Ltd.* made a preliminary investigation of possible Nigerian lead-zinc deposits during the last dry season. A number of ore shoots were located which may prove mineable for future production. However, no single substantial ore body was found from which large-scale production could be planned. Future prospecting is anticipated.

ANGOLA—The government has granted the *Angola Copper Company* another prospecting and mining concession near the area it previously granted the company in September 1944. The new area is to the west of the present area and is bordered on the north by the Belgian Congo.

ORANGE FREE STATE—The recent strong inrush of water in the No. 2 shaft of the *Free State Geduld Gold Mines, Ltd.* stopped all sinking. It is reported that the water rose more than 3,000 feet in the 5,600-foot-deep shaft. Water poured in at an estimated rate of more than 2,000,000 gallons a day and rose in the shaft at the rate of about 20 feet per hour. This is said to be the heaviest inrush of water in any of the Free State mines, to have been exceeded only at Venterspost in the Transvaal several years ago. In an attempt to let the water find its own level as quickly as possible, large amounts of water are being pumped into the shaft. As soon as equi-



TYPICAL ROAN ANTELOPE BLAST ROUND

Pictured above is a miner ready to light the fuses to blast a vertical V-cut development round in the Roan Antelope Copper Mines Limited's mine at Luanshya, Northern Rhodesia. During 1951, a total of 291,577 feet of development was driven in the mine. Stope preparation development was 275,632 feet. Ore production was 3,970,000 short dry tons, averaging 2.38 percent copper (0.09 percent oxides). Total blister copper produced was 74,520 long tons.

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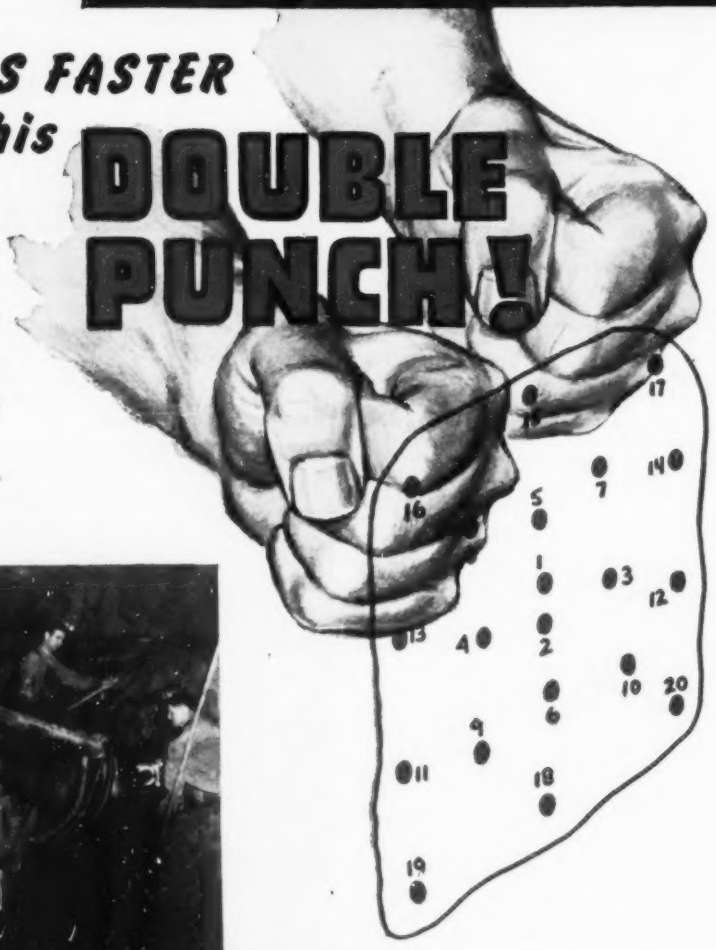

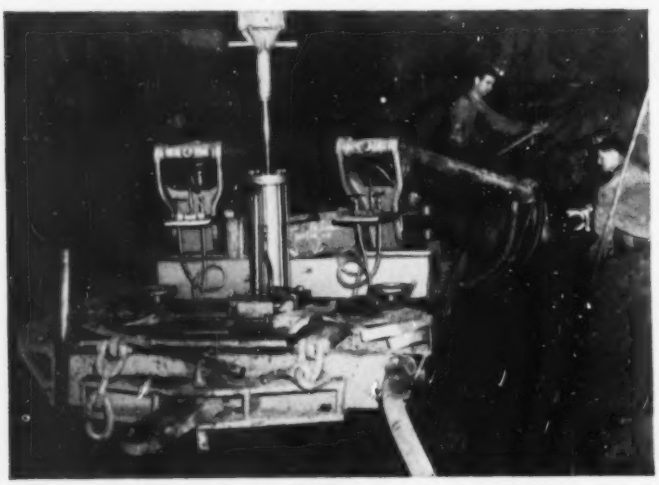

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librium is reached, normal cementation will be started. Transformers and other heavy equipment from various underground stations have been brought to the surface.

FRENCH MOROCCO—The *Societe Cherifienne d'Engrais & De Produits Chemiques* has taken over all assets of the *Superphosphates et Pruduits Chemiques du Maroc* which is a miner and processor of phosphate ores.

SOUTH AFRICA—*Vogelstruisbult Gold Mining Areas Ltd.* will erect a plant for the extraction of uranium from the residue slimes of its gold production plant. Operation should begin in the middle of 1954. A contract with the Atomic Energy Commission of South Africa will provide for the sale of all uranium over the next 10 years.

FRENCH MOROCCO—Output of antimony concentrates in 1951 totaled 1,742 metric tons, compared with 1,217 tons in the previous year. The main producing companies were: *Omnium de Gerance Industrielle et Miniere*, 657 metric tons; *Soc. d'Antimonine de l'Ichoumellal*, 268 metric tons; *Soc. Miniere de Tirza*, 277 metric tons; *Soc. Marocaine des Mines et de Produits Chemiques*, 300 metric tons; and *Soc. Miniere du Djebel-Tazzeka*, 112 metric tons.

SOUTH AFRICA—*Loraine Gold Mines, Ltd.* reports that at the No. 1 shaft, the Basal Reef was intersected at a depth of 4,805 feet below the collar; at 4,818 feet below the collar, due to a fault, the reef was displaced and the shaft entered a dike. The reef exposed was sampled at 5-foot intervals around the perimeter, and the 11 sections sampled gave an average value of 65.61 dwt. over a channel width of 5.33 inches equivalent to 350 inch-dwts. No. 1 shaft is about 1,500 feet northwest of borehole WE1 on the farm Aandenk 227, in the northern sections of the mine property.

GOLD COAST—*Konongo Gold Mines, Ltd.* reports that for the quarter ended September 30, total development was 726 feet, including 271 feet of drifting, 174 feet of crosscutting, 59 feet of excavations, and 222 feet of winzing. Of driving, 77 feet was in reef, 65 feet of No. 9 south drive Zongo proving payable, averaging 9.7 dwt. over 97 inches. Of winzing, 96 feet was in reef, 30 feet at Boabedroo south winze averaging 14.7 dwt. over 86 inches, reef not fully exposed; and No. 8 main winze was sunk 126 feet to 452 feet below No. 8 level and is now below No. 11 horizon. The portion below No. 10 level, Boabedroo, cannot be evaluated until levels No. 10 and No. 11 are driven from the main winze which will be started this month.

SOUTH AFRICA—*Leeuwbosch Lead Mines, Ltd.* reports that the main lode "B" was intersected on the 200-foot level and driving north and south has started. During the quarter, sinking continued below the 200-level in the main shaft. The new shaft on the vein running parallel to the "B" lode has been equipped with a hoist. A new raise started on the "A" lode has exposed lead ore of good grade. Development during the quarter amounted to 309 feet.

NORTHERN RHODESIA—Progress is being made by *Chibuluma Mines Ltd.* in opening up its mine near Kitwe. Production is expected to start in 1956. Meantime, a town is being built and the first houses are already occupied. Plans call for sinking the main shaft below the ore body and parallel to it, with main

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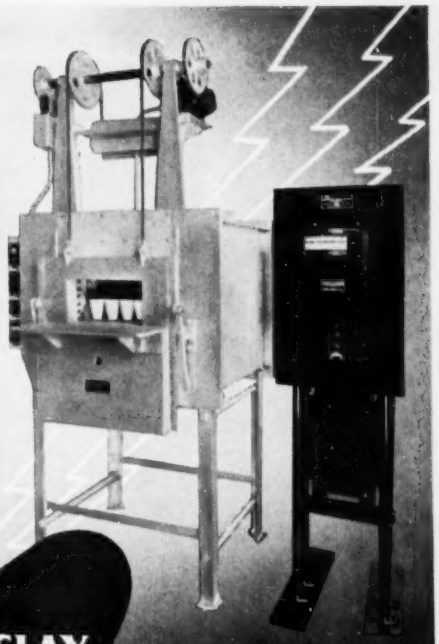

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levels at 530 feet and 800 feet. Mining will be conducted on a retreat system from the center outward. It is hoped to have a daily output of 1,600 tons hoisted in eight-ton skips, producing 16,000 long tons of copper and about 500,000 pounds of cobalt per annum. Power will be supplied by the new inter-mine connection operated by the *Northern Rhodesia Power Corporation*. Chibuluma is a subsidiary of *Mufulira Copper Mines, Ltd.*

SOUTH AFRICA—The steady increase in the consumption locally of mined products is reflected in the mounting production of ferro-alloys by *African Metals Corporation Ltd.* These ferro-alloys include ferro-manganese and ferro-chrome. In the year ended March 1952, total production of ferro-alloys by the corporation reached 21,400 tons, compared with 15,289 tons in the previous year. The improvement is due to the starting up of the two new electric furnaces at the *Kookfontein* works. However, with the growing local demand for ferro-alloys, the tonnage available for export will grow less and less. Accordingly, the corporation is considering the installation of additional electric furnace capacity in order to maintain and develop still further overseas sales.

NORTH AMERICA

BRITISH COLUMBIA—The *Consolidated Mining & Smelting Company of Canada Ltd.* reportedly has placed mining companies on a quota basis in shipping zinc concentrates to its smelter at Trail, B.C. Shipments are said to be restricted to the amount of mine shipments made by the firms during the first six months of 1952. The smelter reportedly has been operating at capacity and cannot handle the increased production of some of the mining companies. Lead concentrate shipments have not been affected.

QUEBEC—*Ascot Metals Corporation Limited* and *Eastern Metals Corporation Limited* have agreed to explore two new discoveries on a joint basis. One discovery is in Bellechasse County about 60 miles southeast of Quebec City, and the other is in Chibougamau. Exploration will be done with Ascot-owned equipment and joint technical personnel so that cost will be at a minimum.

WASHINGTON, D.C.—The Defense Materials Procurement Agency has signed another contract with Canadian firms to supply nickel to the United States. *Milnet Mines, Ltd.* will produce ore from its properties in the Sudbury district of Ontario, while *Falconbridge Nickel Mines Ltd.* will process it at its plants in Ontario and Norway. Milnet will start production not later than March 1, and will mine an average of 2,100 short tons per week until the end of 1954. This arrangement should result in the production of 4,104,000 pounds of nickel in about two years. The DMPA will advance 440,000 to Milnet, repayable with interest as the ore is produced and sold to Falconbridge. Total cost of the project is estimated at $950,000. A similar arrangement was recently made with *East Rim Nickel Mines, Ltd.*

ONTARIO—*Newlund Mines Ltd.* has announced plans to suspend operations

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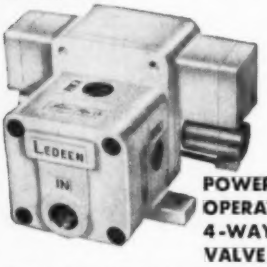

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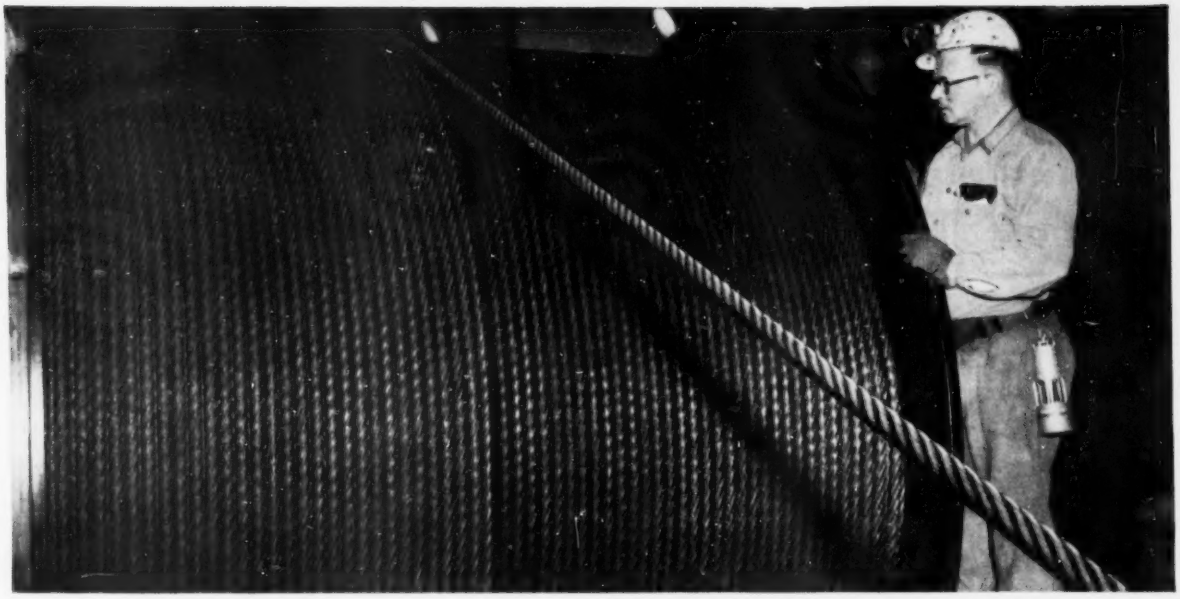

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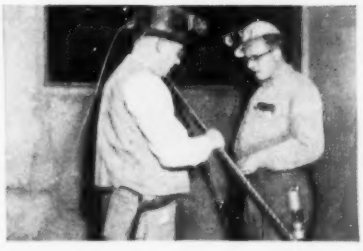

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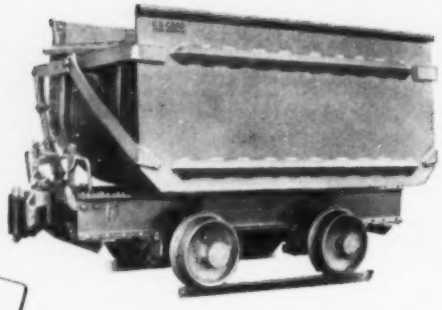

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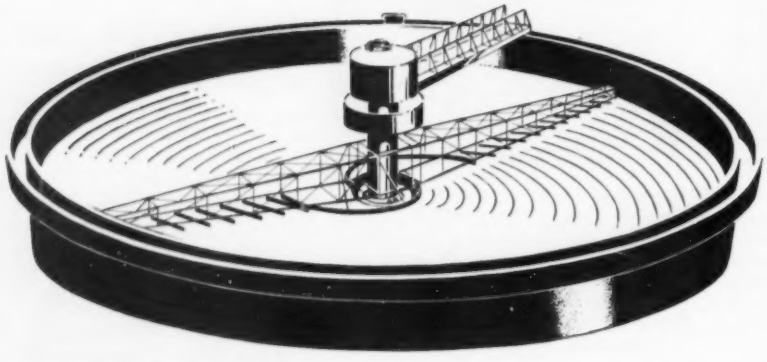

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and close down unless some ore discovery of importance is made soon. To date, exploration at the 800-foot level has failed to disclose any ore shoots. However, Newlund property is very extensive, comprising approximately 1,800 acres, and since only a minor portion of the property has been explored, definite conclusions cannot be reached regarding future ore possibilities. Reopening is expected when and as conditions become favorable again for gold mining.

QUEBEC-LABRADOR—A significant iron ore discovery reportedly has been made by *Fort Chimo Mines* on its 500-square-mile concession in the "Labrador trough." This new discovery, located 200 miles northwest of the main Quebec-Labrador iron range ore bodies, was made by a party working under the direction of J. A. Harquail of *Frobisher Ltd.* Preliminary assays returned values of 42 percent iron, 8 percent manganese, and 26 percent silica. Further prospecting indicated a reasonably low silica content and the possibility that the zone of enrichment may be continuous along the strike of the valley.

QUEBEC—*Beecourt Gold Mines Ltd.* plans to increase its milling rate from a monthly average of 399 tons treated daily, to about 600 tons daily, because of the addition of primary and secondary grinding units.

SASKATCHEWAN—The eight-claim *SH* group in the Athabaska area adjoining the property of *Eldorado Mining & Refining* (1944) *Limited* has been acquired by *Fairbanks Uranium Mines.* An initial exploratory program will be conducted to locate the western extension of the St. Louis fault which is believed to lie only a few hundred feet north of the north boundary. The company was formerly known as the *Fairbanks Yellowknife Gold Mines.*

NOVA SCOTIA—At the *Smithfield* property of *Minda-Scotia Mines, Ltd.* values are reportedly still being encountered in broken formation. Car samples from two sections of the new drift on the 200-foot level are said to have assayed 9.86 percent lead and 3.11 percent zinc over a length of 53 feet, and 5.83 percent lead and 1.98 percent zinc over a length of 60 feet.

QUEBEC—*Weedon Pyrite & Copper Corporation Ltd.* of Sherbrooke expects its new concentrator to go into operation soon. Machinery installation is now well-advanced and the crushing circuit is almost operable. Construction of auxiliary buildings is in the final stages and mine rehabilitation has been largely completed. The mine, which is at present shipping 130 tons daily to meet requirements of *British Metals Corporation,* expects direct shipments to reach about 10,000 tons once Weedon's own concentrator is in operation. With reference to ore output since August, consulting engineer Robert Devlin reports that copper and zinc content is running higher than calculated and all sulphur requirements are being met. O. A. Runge, formerly manager of *Anglo-Rouyn Mines,* has been appointed manager of Weedon.

YUKON—*Ankeno Mines Ltd.* has signed a contract to drive an adit and complete 1,500 feet of lateral work on the extension of *Mount Keno Mines Limited's* Hogan vein in the Keno Hill district. The underground work is to be undertaken on the recommendation of the company's consulting engineers, Powelson and Johnston. A 30-ton mining plant is scheduled to reach the property shortly and the

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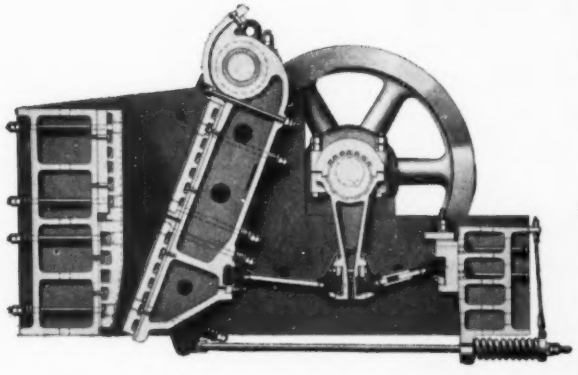

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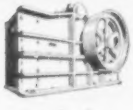
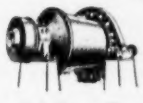

Jaw Crushers

Gyratory Crushers


Grinding Mills

Kilns, Coolers, Dryers

adit is expected to be started almost immediately. Besides the extension of the Hogan vein, Ankeno Mines is believed to hold the possible extension of *United Keno Hill Mines Limited's* Onek vein. Work may be carried out underground at a later date to explore this possibility.

PENNSYLVANIA—*Rem-Cru Titanium, Inc.* is expanding its facilities to more than double present ingot capacity. New melting facilities are being installed at the company's plant at Midland. The ingots presently produced weigh up to 1,200 pounds each. The new furnaces and changes in the existing furnaces will raise ingot sizes to a range of 2,000 to 4,000 pounds by the end of 1952.

ALASKA—The Defense Minerals Exploration Administration has approved a loan of $16,200 out of a total of $18,000 to be spent to search for tin in the Fort Gibbon mining district. The grant was made to I. W. and S. E. Purkeypile.

NORTHWEST TERRITORIES—*Indore Gold Mines Ltd.* now has its 20-ton uranium concentrating mill in production at its Hottah Lake property. Indore is the first privately owned uranium property to report reaching the production stage since the end of World War II. The company also owns other uranium-bearing properties in the area.

YUKON TERRITORY—First hydroelectric power has started to flow into the Elsa mill of *United Keno Hill Mines Ltd.* from the Dominion Government's Mayo River Dam project. This is expected to result in at least a 50-percent cost saving over the Diesel power previously used at the mill. The firm has contracted with the Northwest Territories Power Commission to purchase a minimum of 1,600 hp. for a period of 20 years at an initial rate of $125 per hp. per year, subject to revisions as provided by the contract. Until recently the company had been generating 2,250 hp. to supply requirements at the Elsa mill, and the *Hector-Calumet* and *Onek* properties. The Diesel equipment will be maintained as stand-by equipment.

ILLINOIS—*Consolidated Feldspar Corporation* has agreed to sell most of its assets to *International Minerals & Chemical Corporation* in exchange for 108,534 shares of International's common stock. Consolidated Feldspar produces feldspar, aplite, mica, lepidolite, flint, and beryl. It operates open-pit and underground mines in New York, New Hampshire, South Dakota, Arizona, and Colorado.

YUKON TERRITORY—*Bellekeno Mines Limited* will undertake a $200,000 development program at its *Whipsaw* claim on Sourdough Hill where a silver strike has been made. Development will consist of driving two lateral headings and one raise. Additional mucking equipment, drills, tramcars, and a compressor have been ordered.

ALASKA—The *C. J. Berry* gold dredge, operating on Mammoth Creek in the Circle district, has closed down operations for the season. Harold Christensen, manager, reports that this is an early shutdown date for the dredge which started its seasonal work early this spring. However, snow was already drifting in at Eagle Summit. The *Chena Mining Company* operating on Jackson Creek has also closed down for the season. Bill Pinto and Carl Poorman are partners in this operation.

NEWFOUNDLAND—Four more major United States firms are sending mineral exploration parties into various areas of the province to continue the current exploration interest in Newfoundland's possibilities. Other major companies have also indicated interest. These companies include: *American Zinc, Lead and Smelting Company; Selection Trust* (Great Britain); *Geomines* (Belgium); *Newmont Mining Corporation* (New York); *National Lead Company* (New York); *Reynolds Metals Company* (Richmond, Virginia); and *New Jersey Zinc Company.* Of the companies which began prospecting last year, *Frobisher Limited* has made a promising find of native copper at Seal Lake in Labrador, and *Falconbridge Mines Ltd.* is thoroughly probing a zinc-copper find near Indian Brook. Of the new companies brought in by *Newfoundland & Labrador Corporation,* most active currently is American Zinc, Lead & Smelting. Two prospecting parties went into the field in July, one near Lake St. John and the other south of Gander.

ONTARIO—*Algoma Ore Properties, Ltd.* of Sault Ste. Marie has made funds available to the Michigan College of Mining and Technology for four scholarships in fields related to the development and utilization of mineral resources. Two are to be awarded to Ontario and two to Michigan students. They become affective at the beginning of the 1953 fall term. The scholarships are designed to cover the full costs of a four-year college course in any field of engineering which is related to the mineral industries.

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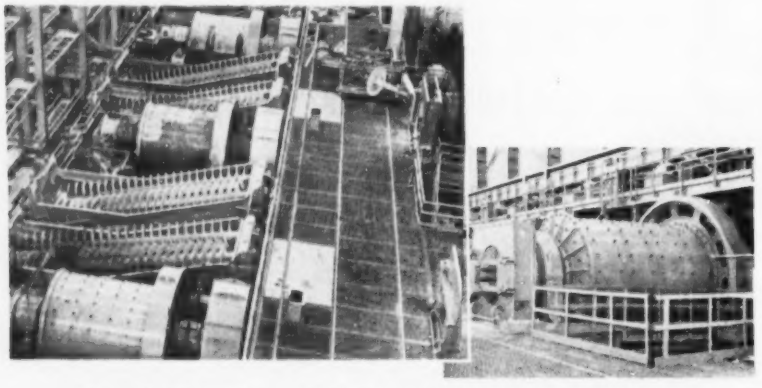

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INTERNATIONAL

SASKATCHEWAN—Current development work of *Rix Athabasca Uranium Mines, Ltd.* is being concentrated in the Smitty section of the company's property near Uranium City. The present program consists of sinking a three-compartment shaft to a depth of 250 feet, with a minimum of 1,500 feet of lateral works on two levels. Diamond drilling for additional depth development will be undertaken from the lower level. Estimated cost of this program is $250,000, and the time scheduled is about six months. A complete Diesel-powered mining plant has been installed; a two-mile road connection to the Bushell-Eldorado Highway has been completed; all basic mining equipment is now at the property; and the head-frame erection is finshed. Actual shaft sinking is almost completed and work thereafter will consist of ore development on two levels and four headings, simultaneously if possible. If the program proceeds on schedule, tonnage estimates, grade, and profit potential estimates are expected to be made by the spring of 1953.

BRITISH COLUMBIA—*Draper, Dobie & Company* of Toronto is heading a group which will provide the initial capital to explore the productive holdings of the newly incorporated *Dodge Copper Mines* in British Columbia. Initial work of the property, comprising 130 claims on Quadra Island 110 miles northwest of Vancouver, will be carried out under the direction of Dr. W. W. Weber, discoverer of the zinc-silver deposit of *Barvue Mines Ltd.* Dr. Weber and his staff are attempting to confirm an already reported visible 1,000,000 tons of over 2.5 percent copper ore, and justify the erection of a 1,000-ton concentrator. After completion of dock and camp facilties at an estimated cost of $25,000, the company plans construction of a truck road from Gowland Harbor to the showings; an eight-week topographic survey; test pitting and sampling all exposures of the ore-bearing zones; and test shipment of 5,000 tons of open-cut ore to a copper smelter at Tacoma, Washington.

ONTARIO—For the first time in its 24-year history, an offering of rights is being made by the *Falconbridge Nickel Mines Ltd.* in order to raise $10,000,000 to complete its current expansion program and also to provide funds for the time when underground development of the ore body under Lake Fecunis is undertaken. Thayer Lindsley, president of Falconbridge, confirmed the importance of this ore body discovery when he recently stated, "Diamond drilling has continued and to date there is indicated in this new ore body at least 10,000,000 tons of ore, equal to or better in grade than the last published reserve figures. The latest drill hole completed in this ore zone gave over 800 feet of mineralization, averaging over-all a good grade ore, and with some sections of unusually high grade. A measure of the importance of this new discovery lies in the fact that the ore body contains sufficient nickel to supply the plants for at least 10 years, when they reach their newly expanded production rate. Diamond drilling will be continued in this area. . . . About a mile and a half further to the northeast another new ore zone has been located and is currently being explored by drilling. . . ." As conditions permit, it is planned to begin shaft sinking in the vicinity of the new ore body under Fecunis Lake to prepare it for eventual production.

THAILAND—Nine banks and an import-export firm have joined together to handle exclusively the import of gold into Siam. The group reportedly plans to import around 60,000 ounces a month, mainly from the Netherlands.

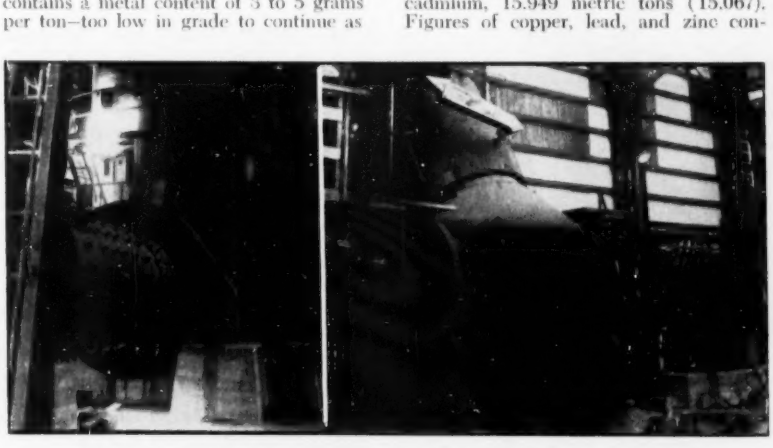
TURKEY—Prospecting for scheelite at Uludag near the city of Bursa has been successful. An orebody reported to be more than large enough for economical operation has been located, containing an average of two percent tungsten trioxide. Drilling is being carried on by MTA to determine the extent of the deposit.

JAPAN—Many of Japan's major gold mines have shut down and many more may have to if the government does not set up more effective countermeasures than it has so far. To date, the *Sado* mine in Niigata perfecture, operated by the *Taihei Mining Company*, and the *Kasuga* mine in Kagoshima prefecture, operated by the *Nippon Mining Company*, have already closed because of high operating costs. The *Takatama* mine, (Fukushima prefecture), the *Arakawa* mine (Kagoshima prefecture), and the *Kawazu* mine (Shizuoka prefecture), all owned by the *Nippon Mining Company*, are considering reductions in their operations. The *Kamioka Mining Company* is debating about maintaining capacity operations of its *Kushikino* mine (Kagoshima prefecture) because it recently expanded its 200-ton cyanide plant to 400 tons. Most of the gold ore contains a metal content of 3 to 5 grams per ton—too low in grade to continue as a profitable operation. The average production cost is 679 yen per gram, based on the extraction of 7 gram content per ton, against the selling price of 512 yen to gold fabricators. The gold mining industry suggested the following measures as a relief for the industry: (1) increase the exploration subsidy for gold mining. (2) increase the selling price and the amount of free gold sales, and (3) give tax-relief to the gold mining industry.

INDIA—The Indian government has rejected a German proposal to install the Krupp Renn process for making iron from low-grade iron ore. Three plans are now being considered: (1) expansion of existing plants, for which a loan of about Rupees 150,000,000 is currently being negotiated with the World Bank; (2) negotiation with ETNA (an American-Japanese firm) for an integrated pig iron and steel plant of 350,000 annual tons capacity; and (3) a proposal to set up a small unit to produce 75,000 tons of pig iron a year.

TURKEY—*Bilgin Mine Company* of Iskenderun, primarily an operator of chrome mines, is said to be interested in a rich gold deposit, the location of which has not been disclosed. Samples of the gold ore are said to have indicated that it will be an important deposit.

JAPAN—The production of primary metals during the month of September dropped below the output of August. Production is reported as follows, with August figures in brackets: electrolytic copper, 7,787 metric tons (7,925); electrolytic lead, 1,746 (1,578); electrolytic zinc, 4,054 (4,219); distilled zinc, 1,622 (1,683); gold metal content, 509,916 grams (514,589); silver metal content, 14,686.373 grams (13,669.512); tin, metal content, 62.098 metric tons (63,-402); quicksilver, 10.167 (10.191); and cadmium, 15.949 metric tons (15.067). Figures of copper, lead, and zinc con-



JAPANESE NICKEL RECOVERY PLANT

Some of the equipment used by Besshi Mining Company Ltd. in the smelting and refining of nickel ores imported from New Caledonia is pictured above. The tube mill, Skinner multiple hearth, and reaster are shown on the left, and the converter on the right. Before the war, the company operated one of the larger nickel smelters with a maximum monthly production of 170 metric tons of electrolytic nickel per month. In December 1950, the company resumed production on a small scale producing electrolytic nickel out of nickel sulphate produced from nickel matte and scraps, most of which was war surplus or imported at random from abroad. Three long-term contracts now assure nickel ores for refining at the plant, and the plant has been processing these ores during 1952. The smelting equipment on the site of the Shisakajima smelter and the electrolytic refining equipment on the Niihama refinery, both on Shikoku Island, southeast of Honshu, have been expanded and are now capable of producing 100 metric tons of electrolytic nickel monthly. President of Besshi is Sotoji Tanaka.

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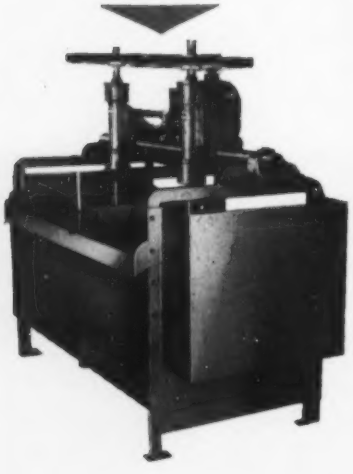

The picture above shows only half of the batteries of Agitair Flotation Machines used in this vast installation for copper ore production.

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tain scrap partly, as follows: about 50 percent in copper, 20 percent in lead, and 4 percent in zinc.

CEYLON—Exports of refined monazite sand containing between 2 and 22 percent of the radioactive mineral, thorium, will be started soon to the United Kingdom and the United States. Sands are concentrated now by magnetic separation in a pilot plant at Katakurunda.

THAILAND—*Tromal Prospection Ltd.* is carrying on negotiations with the Ministry of Industry to form a comany, with the Siamese government as a major shareholder, to work alluvial cassiterite deposits in the sea near Bhuket. It is planned to construct a special dredge equipped with large clamshell grab-buckets.

INDIA—A policy of conservation, along with economic working and utilization of mineral wealth of India, has been urged by the Planning Commission in its revised draft of its Five Year Plan. Three experts have been provided under the Point Four Program to assist in the execution of a program of mineral development and the Planning Commission feels that these men should be retained for three years so that they may help to train junior members of the Geological Survey. The Commission believes that there is great waste of marginal ores which are either thrown away on mine dumps, or left in the mines. They recommend that mine dumps throughout the country be carefully examined and sampled so that their valuable mineral content may be recovered.

JAVA—A government loan of 15,000,000 rupiahs has been requested by the Development Committee to assist in the expansion of a copper mine near Tirtonojo, Surakarta, and a petroleum well at Klantung, Kendal. Zinc ore is reported to be present in the copper mine.

TURKEY—A permit has been granted by the government mining department to operate a newly located molybdenum mine near the coast of the Black Sea. The name of the interested company has not been disclosed.

INDIA—The government is now permitting the export of 10,000 flasks of mercury from the stock held by Indian merchants. Buyer response from the United States is reportedly slow. The export price has been set at around £55 10s free on board, including an export duty of £22 10s. U.S. customers are not willing to pay more than £54 7s 6d. Interest from Japan, Great Britain, and France is said to be limited.

JAPAN—Two gold deposits have been reportedly located in Shizuoka prefecture southwest of Tokyo. One ton of ore was said to contain an average of 20 grams of gold. The deposits supposedly consist of several small veins extending over 20 miles.

THAILAND—The Mines Department is making preparation to open up a wolframite mine at Sapum in Bhuket, and a tin mine at Koh Saba in Songkhla. Equipment for these operations reportedly will be supplied by the Mutual Security Agency. The country's tin production dropped from 6,223 long tons tin-in-concentrate for last year's period extending from January to August, to 5,918 long tons for the corresponding period this year. The average number of dredges working per day this year is 24, compared with 29 last year.

INDIA—*Indian Copper Corporation Ltd.* had a very successful year. Ore treated in the mill was the second highest, being 2,267 tons below the peak year of 1940. Refined copper produced was the highest output, 7,083 tons. Rolling mill production decreased because of market conditions and transportation restrictions.

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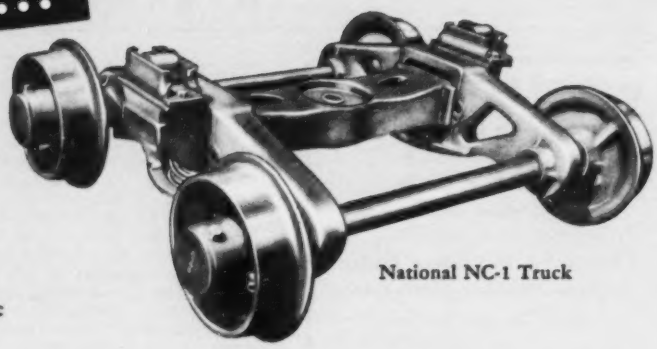
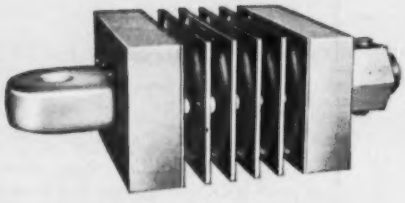
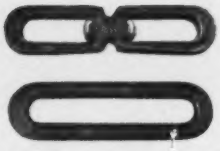


National NC-1 Truck

National M-225 Rubber-Cushioned Draft Gear



National M-230 Rubber-Cushioned Draft Gear



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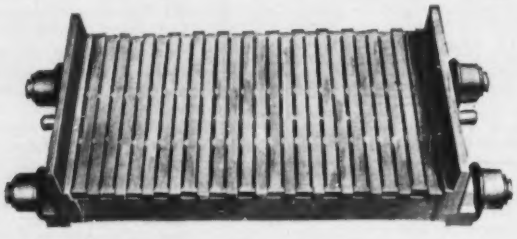

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WATER LUBRICATED PUMP SHAFTS prevent wear in bore hole pumps for mine dewatering. The Johnston Pump Company has a pump for every purpose and features a renewable shaft sleeve in their turbine pumps. If you are pumping liquids, Johnston hydraulic engineers can help you. Circle PEP No. 23.

GREENSBURG LOCOMOTIVES HAUL MORE AT LESS COST: On job after job, Greensburg storage battery locomotives have proved superior because they are custom-built for the job. Advanced engineering design makes them 20 percent more efficient. Longer battery life than any other storage battery locomotive of equal weight and battery capacity is assured. Find how to save transportation money by circling No. 42.

NEWEST POWER IN PLASTIC: The Electric Storage Battery Company announces the Exide-Manchex battery for all small power applications. Output is up to 24 ampere hours at an eight-hour rate. This battery features exceptional ruggedness, with high power ability in greatly reduced space. Transparent cover and container, long-life Manchester positive plate, and double insulation are a few of the special features. For additional information, circle No. 47.

500 TYPES OF WIRE AND CABLE: This new 186 page catalog lists all types of wire and cables for mines, portable cords, building wiring, and telephone service. Comprehensive data are listed for construction and operating characteristics of wires and cables, as well as detailed engineering section. Everyone uses electricity, everyone uses wiring, everyone needs this catalog—its yours by circling Nos. 51 now.

BECKMAN 10-CHANNEL ANALOG COMPUTER: This Ease Computer can be used as an equation solver, a simulator, or a tester. It can solve seventh order, and sometimes higher, linear total differential equations. It is low in cost yet sufficiently flexible to be successfully used by every industrial, research, and educational group working on dynamics. PEP No. 56.

DESIGN YOUR REDI-FAB BELT CONVEYORS: The Barber-Greene Company has a new 40 page catalog which makes it easier for you to figure your own conveyor belt requirements. The selection of the proper conveyor with the correct size of drive and motor is assured. Using the new layout sheet you can make your own layout, accurate in every detail. Select your Redi-Fab conveyor and order the components from Catalog RF. Send for the Redi-Fab catalog by circling No. 24 and design your own conveyors.

HEIL TELESCOPIC HOISTS give double-acting truck body dumping at 70° angle for fast clean dumping of loads up to 50 tons. The hoist has a built-in snubber to prevent "kickback" or over-dumping with a sticky load. Circle No. 28 for more information.

RATCHET HOIST LIFTS 3,000 POUNDS. The new Coffing, hand-operated, ratchethoist lifts up to 3,000 pounds. The load is suspended on a ratchet pawl at all times, cannot slip, nor will the holding mechanism freeze. The handle operates with partial or full strokes. Safety stops prevent spinning of the handle. For further information, circle PEP No. 34.

AIR-COOLED RADIAL COMPRESSORS: Capable of producing 80 to 125-pounds pressure are described in the new Worthington bulletin, PEP No. 53. Pictured and explained are articulated connecting rod, fan cooling of isolated cylinders, forced feed lubrication, and feather valve. Dimensions and weights, capacities, size and cross-section photographs are available for these compressors. Circle No. 53.

COTTRELL WHIRLCONE SEPARATOR: Actual plant experience proves that the Georgia Iron Works Company's Cottrell Whirlcone pays for itself in recovering valuable material in the 100-mesh range normally discharged to waste. Circle No. 27 for data on this separator.

SAFER, FASTER CAR COUPLERS: Willison automatic couplers require no manual assistance in either coupling or uncoupling—an important factor in mine safety. Either end of a car can be the front with these symetrical units—no lost time in reversing. Close coupling prevents damaging slack. Circulars nos. 1746 and 5240 have the details. Circle No. 18.

BLASTERS HANDBOOK MEANS BETTER BLASTING: This new and completely revised handbook will save you money on all types of blasting at every job. See for yourself how the industry does it, reference charts and tables add to its usefulness. Contains the latest approved safety measures. A copy may be obtained for $1.75 from DuPont Powder Company, Explosives Department 2539-D, Wilmington 98, Deleware, or send $1.75 to *Mining World*.

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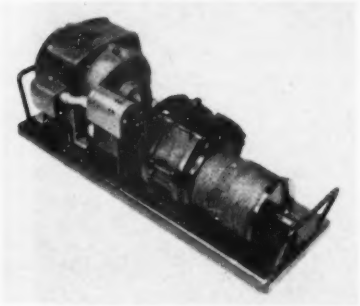
Multi-Purpose Winching With Stampco's Tugger

The Anthony Machine Products Company of Minneapolis now markets a new portable winch called the Tugger. With motor sizes ranging from ¾ hp. to 7½ hp. in either electric or gasoline power, the Tugger is one of the most versatile



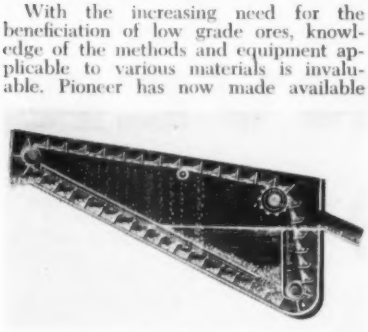
winches now available. Line pull varies from 500 pounds to 1,500 pounds at speeds between 55 and 220 feet per minute.

Other features include instant reversibility, automatic braking when gears are in the neutral position, built-in governing brakes for free-falling loads, and mechanical efficiency of over 95 percent.

To obtain free literature and price information on the Tugger, circle no. 71.

Pioneer Publishes Classifier Bulletin

With the increasing need for the beneficiation of low grade ores, knowledge of the methods and equipment applicable to various materials is invaluable. Pioneer has now made available



a new booklet covering the construction features and applications of drag type classifiers.

The drag classifier has long been recognized as outstanding where high capacity is required. For the latest information on this method, circle no. 70.

Frame-Recessed Block Prevents Rope Fouling

The new sheave block introduced by the Alloy Steel and Metals Company has a six-inch throat and is offered with either hook or shackle suspension. The wide throat of the shackle-suspended

model will pass a one-and-one-eighth-inch square knot.

The spacer is an integral part of the side frames, which are recessed for the sheave to prevent rope fouling. Grease seals protect the roller bearing assembly. Long wear under rough use is guaranteed by heavy construction of heat-treated alloy steel. Circle no. 79.

Trailers Featured In New Cartoon Booklet

Athey's complete line of trailers is described in a new illustrated book that discusses job applications. Heavy-duty rubber-tired trailers are now used to advantage where formerly only trucks were

considered applicable. To get the latest information on new and proved practice in on- and off-highway hauling, circle no. 73.

Scintillator Uses Water-Proof Tropicalized Probe

The Model 111 "Scintillator" is a portable scintillation counter having 100 times the sensitivity of the best Geiger counter and yet selling for little more than a good Geiger counter. It is ideal

for prospecting, civil defense, and scientific use. It can be operated from a plane or a moving vehicle. The entire instrument is contained in the probe which weighs only two pounds. The probe is completely waterproof and tropicalized. The ranges of the instrument are 0.05, 0.5 and 5.0 milliroentgens per hour and it is accurate within 5 percent of ¾ full-scale reading. The battery box is carried on the belt and weighs less than four pounds. It has very long battery life and is so simple to operate that it can be used by untrained persons.

Circle PEP No. 79 if you want details of this counter for your next prospecting trip.

Notes From The Manufacturers

Eugene C. Bauer, Jr. has been elected a director of the Pioneer Engineering Works, succeeding *Philip W. Moore*. Mr. Bauer is first vice president of the Kensington Steel Company in Chicago. Both firms are subsidiaries of Poor & Company, Chicago.

Leonard J. Buck, Inc. of Jersey City, New Jersey has been named exclusive export agent in all foreign countries, except Canada, of the electrolytic manganese produced by the Electro Manganese Corporation.

Cummins Diesel Sales, Inc. has a new Spokane, Washington headquarters which will serve the area west of the Continental Divide in Montana through northern Idaho and to the Columbia River in Washington state. *John Cannon* is president of the dealership, and *John Peters* is manager.

Brother replaced brother in the capacity of Road Machinery Division sales manager of The Heil Company, Milwaukee, Wisconsin and Hillside, New Jersey. Moving from the position of Washington, D.C. sales manager to the home office was *Paul Miller*. He replaced his brother, *Robert Miller*, who had resigned to become sales manager of Innes Equipment, Ltd., Heil road machinery distributers in eastern Canada.

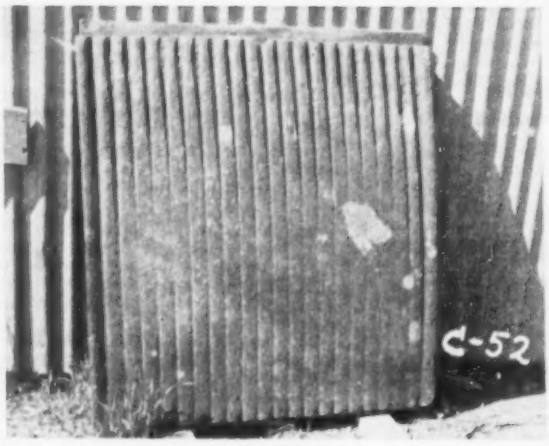
George A. Gillespie has been appointed resident manager of the Paris, France office of the Allis-Chalmers tractor division. He previously was territory sales manager for Europe, North Africa and the Middle East.

Raymond E. Lapean, executive vice president of *Chemical Construction Corporation*, was named managing director of Cyanamid Products, Ltd. Mr. Lapean has been with Chemical Construction since 1940, and previous to that was president of Hugh L. Cooper and Company, Inc., international hydroelectrical engineering firm.

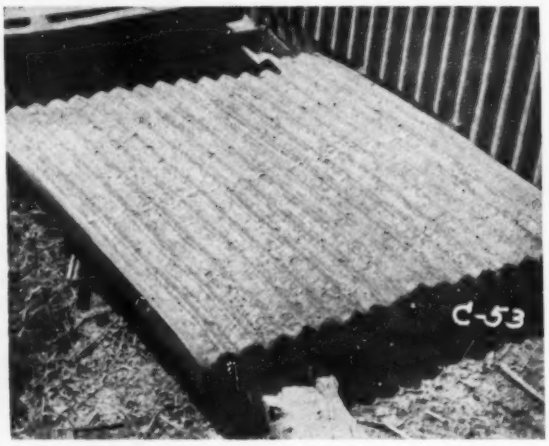
W. H. Pfarrer, vice president in charge of sales and engineering for *Morris Machine Works*, will establish offices in Chicago. Mr. Pfarrer will take over all the territory for the Baldwinsville, New York firm formerly handled by the late F. S. Salchenberger.

New officers of the Industrial Diamond Association of America, Inc., are Harold E. Robison of *Wheel Truing Tool Company*, Detroit, president; William F. Mulins of *Werdiger and Mullins Company*, New York, first vice president; Piet Smit of *J. K. Smit and Sons*, Murray Hill, New York, second vice president; Frank E. Koebel of the *Van Itallie Corporation*, New York, director; and Athos D. Leveridge, secretary-treasurer and executive manager. Members of the board of directors include Leopold H. Metzger of *Super-Cut, Inc.*, Chicago; Walter G. Schwartz of *Craine-Schwartz Diamond Tool Company*, Detroit; John N. Carter of *Carter Diamond Tool Company*, Cleveland; Charles Slesinger of *Charles Slesinger, Inc.*, New York; James A. Ross of *Sprague and Henwood, Inc.*, Scranton, Pennsylvania; Stephen W. Hofman of *Diamond Distributors, Inc.*, New York; and I. J. Meade of *Meade Industrial Diamonds Corporation*, New York.

Rebuild Crusher Plates with N. M. MANGATONE



Before



After

These two pictures tell an interesting story of how to save money on Crusher Plates. Notice in the "before" picture how the corrugations have been worn off in JUST THREE WEEKS crushing of hard, round river-bottom gravel.

Now compare it with the second picture showing the plate rebuilt with N.M. Mangatone. Plant records show that the rebuilt plate was in operation for 32 days before it was removed for another REBUILDING.

If you are throwing away your crusher plates, perhaps this data and more we can quote will convince you that real economies are possible by rebuilding with N.M. Mangatone. Just call in our Field Man for confirmation.

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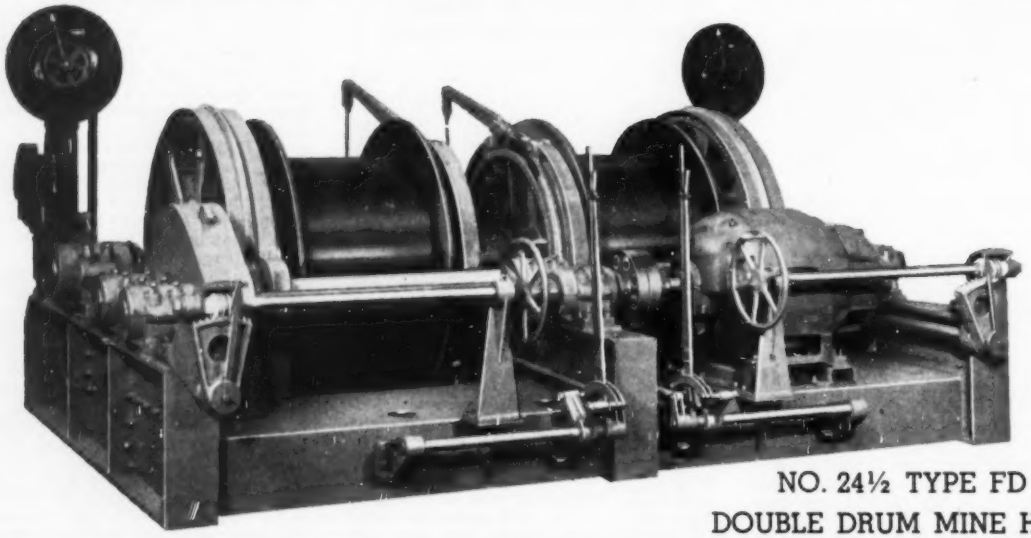

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Rem-Cru Doubling Its Titanium Ingot Capacity

Rem-Cru Titanium, Inc. will have doubled its ingot capacity by the end of the year, raising its ingot sizes from 1,200 pounds to from 2,000 to 4,000 pounds each.

New melting facilities are being installed in the Rem-Cru plant at Midland, Pennsylvania. They will include a new cold mold electric furnace, enlargement of the existing furnace, and exclusive use of two smaller furnaces for intensified research and development on melting and alloying titanium. The melt shop will occupy twice its former space, the metallurgical laboratory is being enlarged, special equipment is being added to the machine shop, double the amount of space is being given to facilities for technical work, sales and office services, and a technical library is being organized in larger quarters.

Rem-Cru, which was the first firm to offer titanium on the commercial market, has to date invested more than $1,000,000 in development work on melting tanium and titanium alloys. The firm is owned jointly by Remington Arms Company, Inc. and Crucible Steel Company of America and was established two years ago.

Uranium Recovery Plant To Be Built in Florida

Work will start soon on a huge phosphate plant which will recover uranium as a by-product. Virginia-Carolina Chemical Company will build the new plant adjoining its present phosphate processing installation at Nicols, Florida, in the heart of the Polk County phosphate fields.

Two other firms in Florida are con structing plants to produce uranium as a by-product. International Minerals and Chemical Corporation hopes to have its new plant at Bonnie in operation by next February, while Davison Chemical Corporation has begun construction at Ridgewood.

The Raw Materials Division of the U.S. Atomic Energy Commission reportedly only has definite arrangements with International and Virginia-Carolina for uranium recovery; however, discussions have been held with Davison and others. While no one plant will produce a tremendous quantity of uranium, the total output from these various Florida plants will add materially to the over-all supply.

St. Joseph Lead Company's lead smelter at Herculaneum, Missouri, which was closed down for a five-week period for repairs and improvements, is now back in operation.

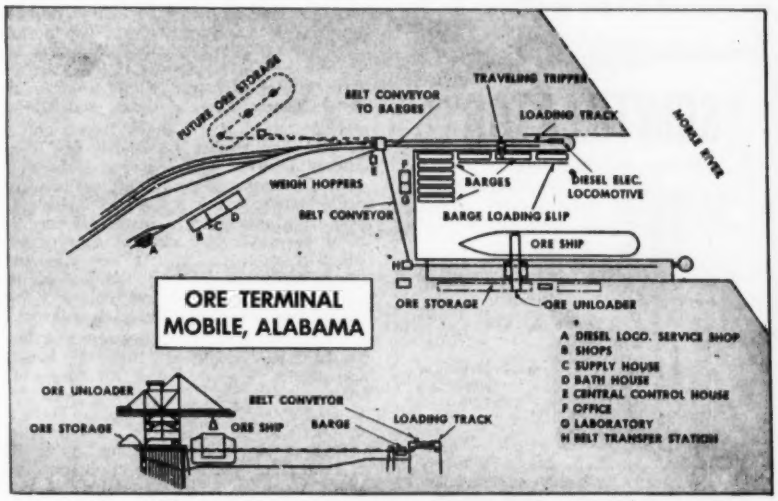
American Zinc, Lead and Smelting Company's joint open-pit venture with *Brown & Root, Inc.* of Houston, Texas, has gone into full-scale operation. The new lead-zinc mine is known as the *Quick Seven*, and is located in the Joplin district of Missouri.

A number of companies are preparing to sell germanium. The *American Zinc, Lead and Smelting Company* has an active project underway at St. Louis and may be in commercial production on a limited volume basis shortly. A new deposit of zinc ore, reportedly running 0.05 percent, at 75 percent recovery would make 5,000 to 6,000 pounds of germanium available annually for the next six or seven years. Discovery of a substantial percentage of germanium in the residue from its electrolytic zinc plant at Corpus Christi, Texas, has encouraged the *American Smelting and Refining Company* to work out an extraction procedure which may increase the supply by another 1,000 to 2,000 pounds per year. *Anaconda Copper Mining Company* is also working on germanium recovery and may be approaching a production basis at Great Falls, Montana. The leading producer has been *Eagle Picher Company*.

Equipment is being delivered on schedule to the property of *Westmoreland Manganese Corporation* at Cushman, Arkansas. About 90 percent of the needed mining machinery is already at the site and the mine-clearing program is reportedly almost complete. The company received a loan of $3,800,000 from the Defense Materials Production Agency to help finance the project which will increase the supply of manganese in the United States. About $2,000,000 of this total loan has already been paid to the firm. Production is scheduled to start next year.

The Lands Division of the Michigan Conservation Department has received an application to lease 1,080 acres of land in the Baraga state forest for copper exploration. The land is about 25 miles from the big *White Pine Copper Company* development. The last mining for copper in the area was in 1921.

The first shipments of staurolite have been made from the Trail Ridge plant of *Humphreys Gold Corporation* near Starke, Florida. The mineral—$FeAl_5Si_2O_{12}(OH)$—is recovered by magnetic separation from tailings of the ilmenite mill.



TC&I'S NEW IRON ORE TERMINAL

To handle imported foreign ore such as that being developed in the vast Cerro Bolivar deposits of Venezuela, the Tennessee Coal & Iron Division of United States Steel Company is constructing a new iron ore terminal at Mobile, Alabama. A 15-ton unloader, operating on four eight-wheel trucks along the dock of a slip on the Mobile River, will deposit ore from the holds of ocean-going ships into hoppers which feed a 42-inch-wide conveyor belt. The ore bucket and operator's cab are suspended from a trolley that runs on the structural steel runway extending 109 feet over the water from the tower. The runway also projects 51 feet from the rear of the tower so that the area below can be used for temporary storage. As the flow diagram above indicates, the conveyor system is so arranged that ore may be loaded into railroad cars, barges, or delivered to storage. Most of the ore is destined for transshipment to TC&I's blast furnaces at Birmingham.

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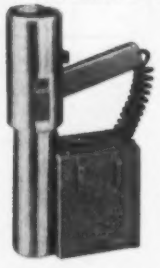

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PRECISION RADIATION INSTRUMENTS
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About 25,000 tons annually are expected to be produced by the addition of this recovery unit to the mill.

Tennessee Coal & Iron Division of the *United States Steel Corporation* is doubling the capacity of its zinc plant at Jefferson City, Tennessee. The plant presently processes about 1,100 tons of raw ore, and produces about 66 tons of zinc concentrate per day. New equipment has been installed and the entire works at Jefferson City is being modernized and enlarged.

The purchase depots at Franklin, New Hampshire, Spruce Pine, North Carolina, and Custer, South Dakota, which presently buy mica, have been authorized to accept up to 25 tons of beryl ore per year from individual producers. Sale of larger amounts from single producers must be negotiated with the Defense Materials Procurement Agency. Producers wishing to participate in the program must notify the General Services Administration not later than June 30, 1953. The program terminates on June 30, 1955, or when a total of 1,500 short day dry tons of ore have been received. Ore must contain not less than eight percent beryllium oxide by weight and must be in the form of clean crystals, cobbed free of waste. A flat price of 20 cents a pound or $400 per ton will be paid.

Magma Copper Corporation reports that for the nine months ended in September 1952, the company produced 24,071,568 pounds of copper and 8,741 tons of zinc concentrates. During the same period last year, the production was 27,978,685 pounds of copper and 9,316 tons of zinc concentrates.

An expansion goal calling for a total supply of 1,100,000 pounds of selenium in the United States in 1955 has been set by the Defense Production Administration. This represents an increase in annual supply of nearly 250,000 pounds over 1950, including domestic production and imports. The principal source of selenium is as a byproduct in the electrolytic refining of copper. Chief imports are from Canada, Sweden, Japan, and Africa.

Exploration at the Black Bayou Dome in Cameron Parish, Louisiana, has been discontinued by the *Jefferson Lake Sulphur Company*. Twelve test wells were drilled, three of which showed a percentage of sulphur, but in quantities insufficient to justify any attempt to produce sulphur commercially. At the Clemens Dome Plant, the sulphur cooling machine and equipment are being enlarged by the installation of additional hearths.

Expansion goals have been announced for tungsten, antimony, titanium, beryl, and barite. A revised goal for tungsten, both domestic and import, has been set at 34,000,000 pounds in 1954. This is an increase of 25,000,000 pounds per year over the 9,000,000-pound rate set in 1950. The goal is not to apply beyond 1955. A goal of 43,000 short tons of antimony in 1955 has been set, which is an increase of 3,964 short tons over 1950. An expansion goal for titanium metal in terms of titanium sponge, has been set at 22,000 short tons per year in 1955, or earlier if feasible. In 1951, the second year of commercial production, the goal was 500 short tons. The goal for beryl has been set at 9,000 short tons in 1955, about 4,200 short tons more than the 1951 supply. An annual supply of 1,360,000 short tons of barite ore has been set for 1955. Included in this figure are 1,000,000 short tons of drilling grade barite, and 360,000 short tons of chemical grade. The goal represents an increase over 1951 of 420,000 short tons of drilling grade and 40,000 short tons of chemical grade.

IRON RANGES

Interlake Iron Corporation directors have voted to purchase *Mather Iron Company's* 30 percent interest in the *Dalton Ore Company*, which will give Interlake sole ownership of Dalton, its chief source of iron ore. Dalton owns interests in about 20 iron ore producing firms which have substantial reserves in Minnesota, Michigan, and Wisconsin. Among these is a 10 percent interest in the *Erie Mining Company*, one of the first to plan taconite concentration on a large scale. The sale agreement calls for a cash payment of $3,275,000; the balance, the amount of which is not disclosed, will be paid on a tonnage basis as ore and taconite pellets are produced and shipped. *Pickands Mather & Company* will continue to act as operating manager of Dalton Ore Company interests.

Following the trend all along the Mesabi Range, the *Hill-Annex* mine at Calumet, Minnesota, operated by the *Minnesota Ore Division* of the *Jones & Laughlin Steel Corporation*, is moving its concentrating plant to a site near the pit. For the past 35 years, the plant had been located about 2½ miles from the mine. The move provides an opportunity for redesigning the plant to handle lower grade, heavy density ores. The old plant was originally a straight washing plant with later modifications for handling leaner ores. The new building, being constructed under contract, is well under way with steel framework about completed. It should be in operation for the 1953 ore season. In the '53 season, electric locomotives will pass out of the picture; conveyors will take over transportation of the crude ore from the pocket to the concentration plant.

M. A. Hanna Company's Enterprise mine at Virginia, Minnesota, shipped its first ore on September 29. Its new shops have been completed, and much of the equipment has been installed. A six-cubic-yard shovel has been stripping 20 shifts per week, and a steel stripping bridge is being built over highway No. 53. At the *Buckeye* mine on the western Mesabi, ore and stripping loading have been carried on 20 shifts per week. At the *Mesabi Chief*, the washing plant has been operating two shifts per day, seven days per week, while stripping has been on a 21-shift-per-week basis. The *South Agnew* has received two new 29 T. churn drills. Ore has been loaded at 20 shifts per week. The *Weggum* addition which will house the electrical shop has been completed. At the *Morton*, the 115 OB dragline has been operating on a 21-shift basis. The new hoist house for the skipway screening and washing plant is under construction. Most of the company's mines on the Cuyuna Range have been working 21 shifts weekly.

The first installation of the new Wilmot-Daniels Heavy-Density concentrating system on the Mesabi Range has been made by *Skubic Brothers* of Virginia, Minnesota. The plant, which will have a feed capacity of 175 long tons of ore per

hour, includes a Roller ore concentrator. This newly developed separatory vessel has been receiving attention in the coal mining industry because of its accuracy. It features unidirectional medium and float material at the weir. The only internal moving part is a standard dragline conveyor for lifting the concentrates out of the bath.

The *U.S. Steel Corporation* broke all production records in October by turning out a total of 3,195,761 net tons of steel, an increase of nearly 120,000 tons over the previous high mark of 3,076,575 net tons in March 1952. This record output exceeded by some 300,000 tons the entire estimated monthly output in Russian steel plants.

Inland Steel Company's new *Cayia* mine, two miles east of Crystal Falls, Michigan, was named in honor of A. J. Cayia, Inland's manager of mines and quarries. A surface plant has been built, the Cayia shaft has been sunk to the 600 level, and a 400-foot level drift has reached the ore body. The mine is expected to attain an annual production of 200,000 tons.

At *Hanna Iron Ore Company's Cannon* mine near Stambaugh, Michigan, progress is being made both on the surface and underground. The company is sinking the 15½ by 20-foot concrete-lined shaft from ledge at 143 feet to the objective 950 feet below surface. The mine buildings, all of which will be connected by covered tunnels, are scheduled to be completed in about one year. Two hoists are to be installed. The ore hoist will have two 1,000-hp., dc. motors and is designed to lift a load of 12 gross tons. The man hoist will have one 1,000-hp., dc. motor.

For the biggest monthly ore movement on record, Great Lakes vessels hauled 14,388,632 tons of iron ore during September. The following week another 3,065,627 tons were transported by water, placing the season's total at 54,219,167—about 19,000,000 tons under what it was last year at this date. To recover part of the losses resulting from the steel mill and iron mine strike, lake carriers have been loading heavily. Before the season opened, they had set a goal of 92,000,000 tons. After the strike, however, the goal was slashed to 75,000,000—with an additional 5,000,000 tons scheduled for haulage by rail. In the latest fleet-expansion move, ten new ore carriers have been ordered, which, when commissioned, will be able to transport an additional 7,000,000 gross tons in a full season. These new vessels can make 35 round trips during the season, while the older ones can only make about 28. These orders represent an investment of nearly $50,000,000.

About 109 gondola cars of iron ore are leaving the Iron River, Michigan district every day for all-rail shipments to furnaces. The Chicago & Northwestern Railway is averaging 85 cars per day, bound for the *Weirton Steel Company* at Weirton, West Virginia; and the Milwaukee road is hauling 24 cars a day from the *Wauseca* mine to Stubenville, Ohio.

Four *Oliver Iron Mining Division* mines —the *Alworth*, *Humphrey*, *Forster*, and *Rouchleau*—will send a total of 80,000 tons of ore to the *Hanna Iron Ore Company's Portsmouth* mine sintering plant at Crosby, Minnesota, on the Cuyuna Range, for test purposes.

Pickands, Mather & Company's new *Peterson* mine at Bessemer is expected to become one of the largest producing iron mines in Michigan. The *Proksch Construction Company* is building surface structures costing about $450,000. Officials estimate that the complete cost of development of the mine will reach $20,000,000. The shaft is down more than 1,700 feet, with crews of six to eight men working three shifts. The new shaft headframe was christened recently in honor of A. F. Peterson, vice president in charge of the mining division of the *Bethlehem Steel Company*. The Peterson is made up of four old mines: the *Puritan*, *Ironton*, *Yale*, and *Colby* mines, with other property. The Colby made the first shipment of iron ore from the Gogebic Range in 1884.

The Minnesota state executive council received 140 bids recently to prospect for iron ore on state-owned lands, largely on worked over lands of the Mesabi, Cuyuna and Vermillion ranges, which either have been abandoned or leases expired. This was the second highest number on record of receipt. The council rejected 12 bids for iron ore mining permits in order to give the state conservation commission time to write rules for possible copper and nickel mining in Minnesota. The bids were on 12 different lots of land in Lake and Cook counties near Ely. *Brule Land and Outing Corporation* of Duluth submitted all 12 bids which were rejected because they were technically for iron ore, not copper and nickel mining.

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Magma Stockholders OK Terms of RFC Copper Loan

Magma Copper Company called a special meeting of stockholders last month to take action on the $94,000,000 loan approved by the Reconstruction Finance Corporation for development of the San Manuel copper property in Arizona. Under terms of the loan, Magma must furnish an additional $8,000,000 to the $11,450,000 it has already invested in the property, operated by its subsidiary, San Manuel Copper Company. With shareholders approval, Magma will contribute $2,000,000 from current available assets, while the remaining $6,000,000 will come from the proposed sale of stock.

The San Manuel property is located in Pinal County, Arizona, about 45 miles northeast of Tucson. Exploration and development, consisting of extensive churn drilling, sinking of two shafts, underground drifts and crosscuts, and diamond drilling, have been proceeding continuously since 1944. Proven ore reserves are estimated at 367,624,081 tons of sulphide ore averaging 0.785 percent copper, and 111,876,014 tons of oxidized ore averaging 0.717 percent copper. The planned production is of sulphide ore only. Planned rate of production is 30,000 tons of ore daily beginning in the latter part of 1956, yielding 70,000 tons of refined copper and 3,080 tons of molybdenum concentrate annually.

The Defense Materials Procurement Agency has already guaranteed the company a market for 365,000 short tons of electrolytically refined copper and 16,060 short tons of molybdenum at a minimum price of 24 cents a pound for copper and 60 cents for molybdenum if the metals cannot be sold to industry.

R. L. Wilson of R. L. Wilson Associates, Detroit, Michigan, has signed a contract with the *U.S. Manganese Corporation* for 20,000 tons of manganese ore to be used in steel production for defense. The *Atlas Mining Company* of Aguila, Arizona, one of Mr. Wilson's five mining holdings, is making shipments on the contract from *Black Nugget* #1 mine in Maracopa County, in accordance with government specifications.

The *American Asbestos Cement Company* has started a diamond drilling program under the Defense Minerals Exploration Administration program. George Kohl of Globe, Arizona is general manager.

W. C. Williams and Emmett Gatlin are reported to have transferred a lease and sales option on the *Westlake* tungsten property, south of Globe, Arizona, to the *Continental Tungsten Corporation*, a newly organized company. Mr. Williams will serve as president of the new firm, while Mr. Gatlin will have no interest in the company. L. O. Morris of New York City is general manager; Phil Morse, secretary; and Dr. P. M. Barrack is treasurer. A small crew is employed in exploration work.

The *Magma Copper Company* of Superior, Arizona, has suspended the production of zinc ore and has closed the zinc section of its mill because of the drop in the price of zinc metal. Workers in the zinc division have been transferred to copper mining. The *Athletic Mining and Smelting Company* has closed down its zinc operations at Klondyke, Arizona for the same reason.

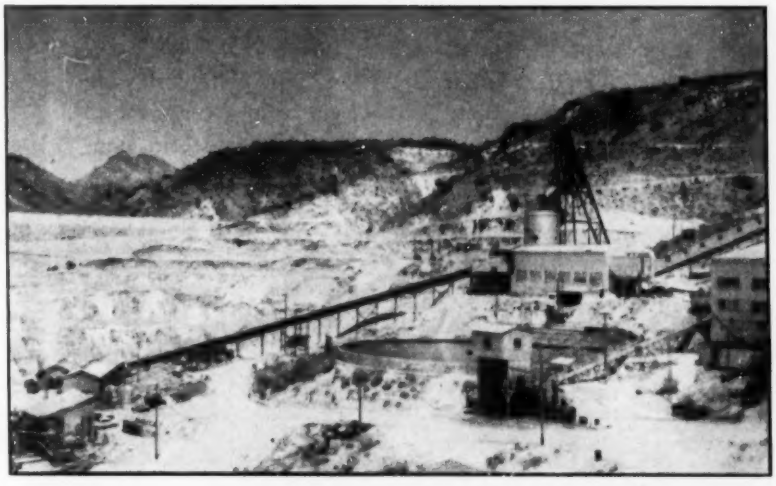
The *Thunder Mountain Mining Company*, headed by Donald F. McGrew of Nevada, reportedly has acquired the *Prospect Hill* gold mine in Humboldt County, California. George Wilder is the former owner. Thunder Mountain has also taken over the *Perch Creek* mine near Orleans, California, in which Mr. Wilder also had an interest. Plans call for open-pit mining at Prospect Hill, and installation of a crusher, ball mill, and tables and bins. Archie Campbell is general manager of the company.

The *Good View* tungsten property in the Mammoth district of Inyo County, California has been stripped and is now ready for open-pit mining. Nick Pappas, owner of the property, reports that large reserves of ore are available. The ore will be trucked to the *U.S. Vanadium Company's* mill at Pine Creek.

An asbestos deposit having traces of titanium has been located in San Bernardino County, about 18 miles from Victorville, California. The property is controlled by *Canada Properties* of Los Angeles who plan to form a special corporation to develop the deposit by open pitting.

Open-pit operations have started at the *Mountain King* mine at Copperopolis in Calaveras County, California. The mine is reportedly controlled by a firm in Fresno, California.

A geological map of the bastnaesite deposits of the *Birthday* claims in San Bernardino County, California, has been published by the U.S. Geological Survey. This is said to be the first area in the United States to offer promise of being commercially valuable. It was discovered in 1949 by Herbert E. Woodward and Clarence Watkins of Good-



DMPA UNDERWRITES BAGDAD'S OUTPUT

The Defense Materials Procurement Agency has guaranteed the Bagdad Copper Corporation a market for up to 27,000,000 pounds of copper per year at 24.50 cents a pound, f.o.b. Middle-Western markets, in return for the proposed expansion program Bagdad has announced it will undertake at its property in Bagdad, Arizona (shown above). The government contract also guarantees a market for up to 940,000 pounds of molybdenite at 60 cents a pound for molybdenite contained in concentrates. The agreement covers eight years of production, terminating automatically on June 30, 1962. Bagdad will increase the company's annual production capacity to 35,000,000 pounds of electrolytically refined copper and 12,000,000 pounds of recoverable copper contained in precipitates. The company's present annual capacity is 20,000,000 pounds of recoverable copper contained in concentrates. The Defense Production Administration has granted Bagdad rapid tax amortization on $11,134,237 of the cost of a new copper producing plant. E. R. Dickie is general manager of the property.

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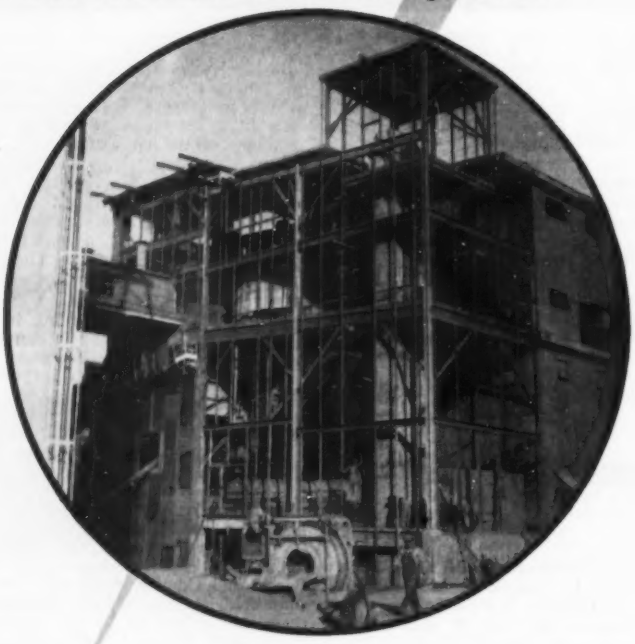

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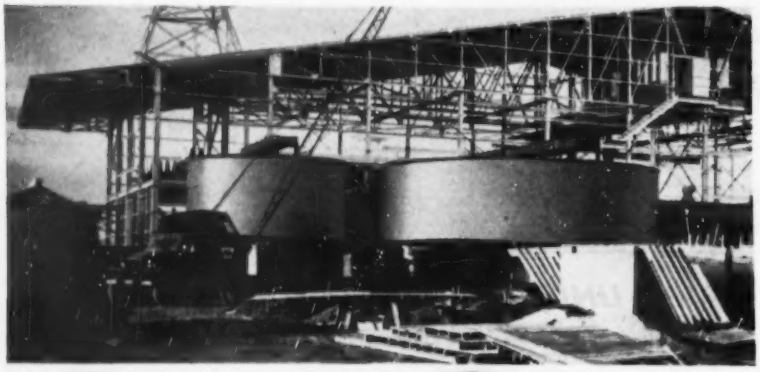

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springs, Nevada, in a small area off Highway 91, 2 miles north of Mountain Pass, California, and 35 miles east of Baker.

The *Golden Key* mine, which has been the subject of much litigation during the past few years, is being reopened by Lee Rowland. The mine is in Mariposa County, California. In the same county, Bill and Lem Burnett are developing a tungsten deposit at El Portal, while J. C. Turnlan of Burbank has leased a gold prospect in the Whitlock district.

NEVADA

Declining lead prices and high operating costs have been responsible for the shutdown of the *Copper Canyon* mine at Battle Creek, Nevada. About 70 men have been laid off. Officials of the *Copper Canyon Mining Company* report that the mine is being kept pumped out and in stand-by condition so that work can be resumed with a minimum amount of delay if the price situation changes.

The Sunnyside mill, under construction since early last spring, is now in operation. The mill has been treating tungsten ore from the *T-Bone* mine owned by *Marsam Enterprises*, the *Kenneth Rogers*, mine and the *Conquest* mine owned by Gale Peer. Although improvements are still to be made, the mill is making an 86 percent recovery on T-Bone ore. Concentrates are sold in Bishop, California. F. D. Shuck is manager of the *Sunnyside Milling Company*.

Thomas Kemp has leased gold and antimony claims in the Ten Mile district, 10 miles west of Winnemucca, Nevada. The property, consisting of the *WP* and *WP No. 1* claims, was acquired from James Porter and Rollin and Frank Harden. Development work to date includes a 560-foot tunnel and two shafts sunk to depths of 50 and 60 feet. Mr. Kemp reports a 3-foot gold vein assaying from $30 to $90, and 3½ feet of antimony assaying 48 percent.

The *Anaconda Copper Mining Company* reportedly is considering taking an option on property held by *Bruhi Enterprises* in the Silver Peak area of Nevada. James Wilson, company geologist; C. E. Peterson, Darwin mill superintendent; and Alex McDonald, company geologist, are said to have examined the property for Anaconda.

Almost 200 feet of the silver-gold orebody have been opened up now by the *Tonopah Development Company* at the *Summit King* mine north of Tonopah, Nevada. From the point of entry on the 300 level, the vein has been probed 130 feet west and 67 east with the ore holding in both directions. Sufficient progress has been made to go ahead with plans for construction of a new main working shaft, with possibly three compartments, and the erection of a mill. These projects probably will not be undertaken until spring but meanwhile underground work will continue. A contract has already been let to George Irwin and Joe Chism and they will proceed with exploration on a two-shift-per-day basis.

Culp and Summers, Oregon mine operators, have leased the tungsten properties owned by Knowles Brothers and Price Montgomery in the Alder mining

district east of Mountain City, Nevada. The new lessees reportedly are building roads to the properties, establishing camps, installing heavy equipment, and preparing to grade a site for a concentration plant.

Big Creek Mining and Milling Company has purchased the Clifton mill from the *Nevada Equity Company*, along with two pieces of adjoining property known as the *Clifton No.* 1 and *No.* 2. The mill, located in Austin, Nevada, has not been used for about 15 years, so extensive repairs are being made before the mill goes into operation. The mill will treat ore from the *Big Creek* antimony mine which is now in operation after considerable repair work caused by snowslides last winter. Tony Romano is general manager.

NEW MEXICO

The *New Jersey Zinc Company's Empire Zinc Division* at Hanover, New Mexico, has closed down because of the drop in the price of the zinc metal, coupled with the rising cost of operations.

The *International Minerals and Chemical Corporation* has put its first continuous miner into operation in the No. 3 shaft at its potash property in Carlsbad, New Mexico. This is the first of two units which have been on order for some time. Each unit when complete will have a surge car attached to the miner. As the ore is cut by the machine, it will be dumped into the surge car. This is discharged into a shuttle car when filled, permitting continuous operation without interruption. Since the surge car has not yet arrived, first tests will be made with the machine loading directly into shuttle cars.

The *El Paso Perlite Company* reportedly is preparing mining operations 19 miles northwest of Gage, New Mexico. Deposits are estimated at 15,000,000 to 20,000,000 cubic yards. A processing plant in El Paso is to turn out 70 to 90 tons of the crushed perlite daily, with planned facilities eventually to handle 250 to 350 tons daily.

Anaconda Copper Mining Company is reported ready to open a small coal mine employing about six men and producing 75,000 tons a year, about 28 miles east of Grants, New Mexico, to get fuel for its uranium processing mill which will be completed near Bluewater next year. A new type of coal augur that allows continuous mining and eliminates blasting and explosives may be used. It is made by the *Cardox Corporation*.

Scientists of the New Mexico Bureau of Mines and Mineral Resources are seeking to improve the Navajo indian economy through discovery of mineral and water resources on the reservation. Some 450 square miles of the reservation near Fort Defiance, New Mexico will be studied and mapped under a mineral survey contract granted by the U. S. Bureau of Indian Affairs, under authority of the Navajo Rehabilitation Act. The survey will determine whether there are mineral deposits such as coal, uranium, petroleum, gem stones, gypsum, building stone, and other products of economic value which can be developed for the use of the Navajo.

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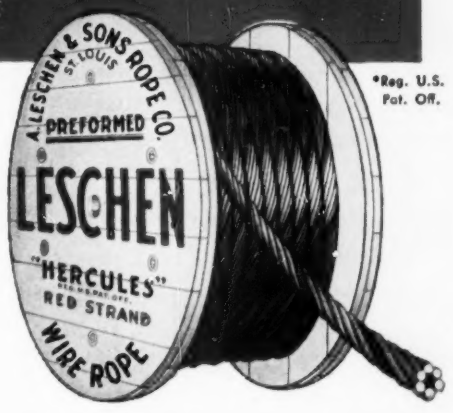

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Nation's Aluminum Output Hit By Power Shortage

The aluminum industry is urging the government to use its emergency stockpile to help tide the nation over a temporary shortage in production which is expected to result from new cuts in power ordered by the Defense Electric Power Administration last month. They suggest that the government stop stockpiling aluminum during the first quarter of next year, and actually give fabricators supplies from the defense reserve.

Severe droughts in the Pacific Northwest and in the Tennessee Valley have resulted in a 10 percent cut in electric power for both areas. The industry says that this will mean losses of about 40,000,000 pounds of aluminum a month, or about 25 percent of the nation's total primary aluminum output. The industry had already been losing 30,000,000 pounds a month because of the power shortage.

In the Pacific Northwest, more than 165,000 pounds of aluminum are being lost daily since the November cutback. This amount is in addition to the 790,000 pounds being lost since early September when the Bonneville power administration cut off all of the 388,000 kw. of interruptible power, and the 100,000 pounds daily loss when the Reynolds Metals Company of Longview, Washington was forced to close down one of its three potlines. This latter action was caused by the expiration of a 20,000-kw. contract with the public utility district of Cowlitz County, Washington.

The Aluminum Company of America says that the new cutback means a loss of more than 1,000,000 pounds a month at the Vancouver, Washington, plant, and nearly 500,000 pounds at the new plant at Wenatchee, Washington.

Power men do not offer much hope for relief in the situation. They expect the shortage, to continue until next April when the winter snows (just beginning to fall) start running off into streams and rivers.

Ione Mining Company has discovered high-grade lead ore at its Summit mining district property east of Murray, Idaho, Otto M. Nordquist, president and manager, reported. The unexpected discovery climaxed three summers of exploration work in a new lower tunnel. The ore was found in the footwall of a quartz-siderite structure when a raise being run on the dip of the structure was flattened from a 65-degree angle to 45 degrees. It was planned to make direct smelter shipments of high-grade and stockpile mill-grade for future milling.

Clayton Silver Mines has instituted long-hole drilling at its property near Clayton, Idaho, in an effort to reduce costs of blasting down ore, according to W. M. Yeaman, president. Fifty-foot deep holes were being drilled at last report.

Spokane-Idaho Mining Company has opened zinc-lead ore for about 200 feet on the 1,800-foot level of its *Constitution* mine on Pine creek in the Coeur d'Alene mining region, Idaho, and is cross cutting to the vein on the 2,000 level, General Manager Brower Dellinger reports. Stoping preparations are underway at the firm's adjoining *Douglas* mine operation.

Day Mines, Inc. of Wallace, Idaho has virtually completed straightening, enlarging, and re-equipping the 3,000-foot *Rainbow Mining and Milling Company* adit in the silver belt of the Coeur d'Alenes, according to Paul B. Jessup, vice president. Upon completion of the work, miners were to start extending the tunnel southerly to explore *Triangle, Sterling*, and *West Fern* ground. *American Smelting and Refining Company* has an interest in the project being carried out under an easement from Rainbow Mining and Milling Company, a subsidiary of *Coeur d'Alene Mines Corporation.*

Idaho Custer Mines, Inc., recently suspended mining and milling of lead-zinc ore at the old *Livingston* mine in Custer County, Idaho, pending an improvement in metal prices, and began an investigation of lower levels of the famed old producer. The 2,400 and 2,500 levels were being unwatered, according to President Paul Grosenick of Seattle. Production was coming from the 2,200 adit and levels above.

In preparation for winter operations, *Goldstone Mining Company* installed a 2,000-gallon Diesel oil storage tank, purchased five new ore cars, built a new powder magazine and blacksmith shop, and weather-proofed mine camp buildings at the *Goldstone* mine near Salmon in Lemhi County, Idaho. B. W. Porter of Seattle, president, said eight men planned to remain at the property all winter to advance the lower level Goldstone adit an estimated 700 feet to the Goldstone gold-copper ore body. Summer exploration work at the nearby *War Eagle* property opened a promising showing of galena at a depth of 65 feet.

Bullion Mining Company Ltd., of Wallace, Idaho has reopened old workings of its property in the St. Joe mining district to facilitate geological examination by large mining firms.

Fire of unknown origin destroyed $40,000 worth of mine buildings and machinery at the *Snoose Mining Company* property in Blaine County's Mineral Hill district, Idaho, causing suspension of production and exploration under a $135,000 DMEA project. Manager A. M. Jensen said the plant will be rebuilt.

The *Turtle* mine located in the Bayhorse district of Custer county, Idaho has been taken over by *La Florecita Mining Company* of Salt Lake City under a two-year lease and $200,000 purchase option. It is planned to continue development

IDAHO FIRM BEGINS STEADY OUTPUT

Regular production of lead-silver and zinc concentrates has been started by Idaho Lakeview Mining Company after 12 years of development work and intermittent milling of development ores. The 40- to 50-ton daily milling rate of the flotation plant (shown above) has been stepped up to 100 tons per day, and plans call for eventual doubling of capacity. Ore is mined from both the Hewer and Keep Cool mines, located in the old Lakeview area of Pend Oreille mining district in Bonner County, Idaho. Jerome Drumheller is president of the firm, and Earl A. MacDaniel is superintendent.

work on a two-shift basis through the winter and to install a mill. James O'Reilly of Salt Lake City, is in charge. One of the mine's owners, Elray Kimball, has been retained as mine foreman, and the other owner, Leo D. Ivie, will guide construction of a new compressor house and dwellings for miners. A large deposit of milling grade lead-silver and a vein of high-grade silver-copper ore reportedly have been opened.

A promising new vein structure carrying good tetrahedrite mineralization has been opened by *Sunshine Mining Company* at the 3,700-foot level, R. D. Leisk, general manager, reports. It was found unexpectedly 500 feet north of the main Sunshine ore-bearing structure in crosscutting toward an unexplored area of the Silver Syndicate vein. It has not been identified with any known structure on upper levels. At last report, all development muck was being taken for ore.

Antimony production in the United States reportedly dropped 74 percent in August immediately following the closing of the *Bradley Mining Co.'s Yellow Pine* antimony mine near Stibnite, Idaho. The Yellow Pine, which produces 90 percent of the nation's output, closed down because increased imports had forced prices down to a point below the company's break-even operating level. During the same period, industrial consumption rose 40 percent and foreign imports increased 29 percent, says the Bureau of Mines. Domestic antimony production during August was 42 short tons while industrial consumption totaled 1,292 tons, and imports amounted to 1,014 tons.

North Fork Mining Company, an Idaho firm organized in 1949, has made a public stock offering and applied for a government exploration loan to carry out an extensive exploration program at the six-claim *Lucky Strike* property in the Beaver mining district north of Wallace. L. S. Edwards, Spokane, is president and general manager.

Stockholders of *Caledonia Mining Company* have authorized moving of the firm's headquarters from Wallace to Kellogg, Idaho, and reducing its capitalization from $2,605,000 of $1.00 par stock to $260,500 of 10-cent par stock. No further development of the one-time productive *Caledonia* mine southwest of Kellogg will be attempted pending developments in neighboring ground, Stanley A. Easton, president, has informed shareholders. This work may develop "situations of importance to the firm," he said. Caledonia's two patented claims are surrounded by holdings of *Bunker Hill & Sullivan Mining and Concentrating Company*, also headed by Easton.

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MONTANA

The *Mike Horse Mining & Milling Company*, a wholly owned subsidiary of the *American Smelting and Refining Company*, expects to abandon its lead and zinc production permanently because of the low metal price and a substantial exhaustion of ore reserves. The company's property is located about 53 miles northwest of Helena, Montana. About 85 workers are involved in the enterprise.

Mitchell Mining Company has increased compressor and pumping facilities at its *Margaret Ann* mine on the outskirts of Butte, Montana, and is planning to install a new headframe and larger hoist, according to A. W. Anderson of Seattle, a company agent. Opening of a new 400 level is expected to permit stepping up of production to four 60-ton cars of silver-gold crude ore weekly. Eighteen men are at work. E. M. Olmsted of Mount Vernon, Washington, is company president and mine manager.

Mineral King Mining Company, headed by C. F. Buls of Missoula, Montana, has leased its 32-claim *Tarbox* and *Meadow Mountain* properties to *Federal Mining and Smelting Company* of Wallace, Idaho. The holdings are three miles north of Saltese, Montana and 12 miles east of Mullan, Idaho. They adjoin properties of *Jupiter Mining Company*, controlled by *Day Mines, Inc.* of Wallace, including the old *Ben Hur* and *Last Chance*. Federal has agreed to spend at least $20,000 a year on development work, according to General Manager J. E. Berg.

Lexington Silver-Lead Mines, Inc., will concentrate on underground development this winter at its Niehart, Montana, properties, according to James A. Allen of Spokane, president. The main adit has been cleaned out for 1,000 feet to near the Puck vein, which will be opened by drifting. Although the 100-ton Lexington mill recently made successful test runs on old dump ore, milling of the dumps will not be attempted in cold weather. A bulldozer and other new equipment have been purchased.

C. A. Lester of Bozeman, Montana, president of *Madisonian Mining and*

Milling Company, reports opening a "potentially large" deposit of chrysotile asbestos in Madison County, about 10 miles west of the West Yellowstone entrance to the national park. Thirty men were employed at the 54-claim property this summer. The firm has spent $50,000 on exploration and development since early in 1951. Lester also is president of *Interstate Products Company* of Bozeman, said to be Montana's only asbestos producer. Amphibole asbestos is taken from an open-pit operation in Gallatin County and processed in a 50-ton company-owned plant in Bozeman.

Linton mines, 25 miles east of Missoula, Montana will discontinue production of lead ore this winter and drive an exploration adit some 200 feet down the mountainside from present workings, according to Thomas J. Linton, a partner in the enterprise.

OREGON

The concentrating mill installed at the *Sourdough* mine on Baldface Creek, Curry County, Oregon, has begun the production of chromite concentrates. Capacity of the mill is about 1½ tons per hour; equipment includes an 8 by 16 jaw crusher, a ball mill and screen, and two concentrating tables. Owners of the mine and mill are F. I. Bristol, Ben Baker, and T. T. Leonard.

Fred Ranes of Sumpter, Oregon, reports that he and his associates have been working their manganese property eight miles out of Sumpter on Dry Creek, and expect to be shipping manganese soon, if the weather remains favorable. He reports, also, that a contract has already been negotiated for the sale of the ore.

By refining electrolytic chromium in a hydrogen atmosphere at high temperature, metallurgists at the Bureau of Mines, Albany, Oregon, experiment station have produced a chromium metal malleable enough to be forged and rolled to sheet and rod. The metal was bent sharply at temperatures as low as 190 degrees Centigrade and when cold was drilled, sawed, and ground.

Apex Smelting Company of Chicago plans to build a silicon aluminum plant at Springfield, Oregon, according to A. S. Barney, company representative Aluminum silicate clay from the Cottage Grove district of Oregon would be made into aluminum-silicon ingots. The firm has been working with the Bureau of Mines' electrometallurgical laboratory at Albany, Oregon, to develop an economical process for the electrothermal reduction of clay to aluminum-silicon alloy.

A small chrome concentrating mill has been set up by Walt Freeman and LaVern Twombly below Sourdough Flat close to the county line between Curry and Josephine counties in Oregon. Equipped with a hammermill, a Gibson rodmill, and one table, the mill will concentrate ore from the *Wonder* group where shallow workings now show considerable chromite.

The *GMC Mining and Milling Company's* concentrating plant near Eagle Point, Oregon, has been purchased by the *Laughlin Engineering Company* of Los Angeles, California, and is now a part

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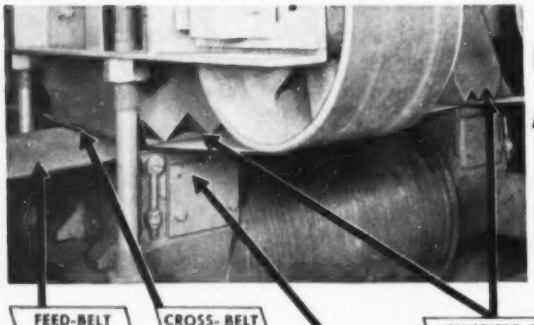

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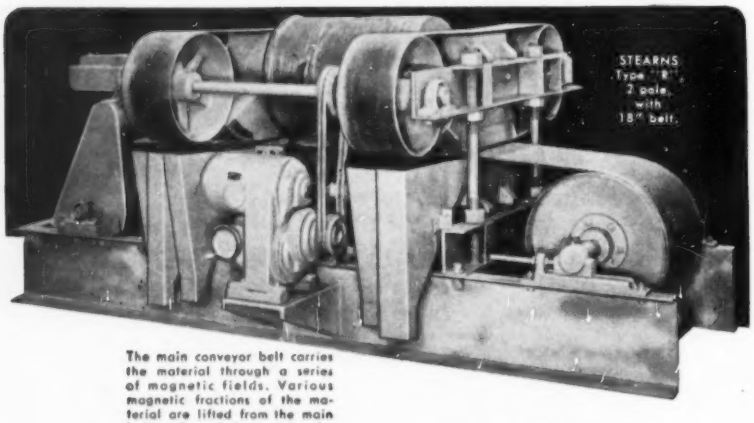

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*Patent No. 2511484

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of the GMC division of this company. Initial production from the mill is chromite concentrate, although manganese ore will also be milled later on. Ore will come from the *Tyrrell* manganese mine which has been leased, and from the *Sordy* mine where chromite has been stockpiled.

WASHINGTON

Robert T. Curtiss and John C. Rogers of Monroe, Washington, will explore for copper in Snohomish County's Sultan Basin district with the aid of an $8,800 government loan. The DMEA-approved project provides for expenditure of $17,600 in extending an old tunnel about 100 feet, crosscutting and drifting.

Pacnor Mines, Inc. has started exploring a group of 47 claims it took over last winter in the Russian Creek area of the Metaline mining district in Washington. Initial work will be confined to diamond drilling, Karl W. Jasper, secretary-treasurer, reported. Graham D. Lammers, Spokane mining man with Alaskan gold interests, is president.

Crescent Mines, a copartnership of Seattle men, has resumed mining and shipping of high-grade manganese ore from the *Crescent* mine on the Olympic peninsula, 30 miles west of Port Angeles, Washington. Ore is shipped to Deming, New Mexico, according to J. E. Hopper, a partner. The mine, operated by *Sunshine Mining Company* in World War II, had been idle since 1946.

Sunny Peak Mining Company's Mohawk property in the Conconully district of Okanogan County, Washington, is being developed under a lease arrangement with Fred H. Story and associates, according to Charles J. Weller of Coulee City, president of the firm. Two tunnel faces are in ore, and construction has been completed on an 800-foot tramway and a 125-ton ore bunker. A compressor and hoist have been installed.

Pioneer Mining Company of Colville, Washington has started mining 60 tons of silver-lead-zinc ore daily from underground workings in its *Longshot* claim in Stevens County's Old Dominion mining district. Initial production, in the fall of last year, was from open-cut mining at the surface. A 500-foot adit subsequently driven to gain 135 feet of depth missed the ore body. A 20-degree angle winze then was run down on the ore from the surface. A raise to the surface and a drift off the raise also were in ore. The ore body has been opened over a length of 150 feet and widths up to 12 feet. Ore is trucked to the Young America mill near Bossburg. Millheads have been running about 10 ounces of silver, and 12 to 15 percent combined lead-zinc.

Pacific Northwest Alloys of Spokane, a subsidiary of *Chromium Mining and Smelting Company*, now is getting silica rock from a new source for use in extracting magnesium from dolomite at the government-owned Mead magnesium plant. The silica is being quarried at Freeman Lake, Idaho. The deposit is north of Newport, Washington, on the Idaho side of the Pend Oreille River. The deposit contains an estimated 300,000 tons. Daily shipments are expected to reach 300 tons. Shipments formerly were from Dennison, Washington.

precipitates—ROCKY MOUNTAIN

COLORADO

American Zinc, Lead and Smelting Company has closed down its Ouray lead-zinc mill, which had operated in Colorado's Ouray district for 30 years. Superintendent William Klein said the shutdown was the result of a greatly increased tax load caused by a recent reevaluation of the property, the abandonment of the railroad, a drop in metal prices, and the increased cost of power —coupled with reduced ore production. American Zinc has operated the mill since 1946.

Cordillera Corporation's Ling tunnel, which is being driven through North Star Mountain in Colorado, should be finished before winter. According to N. Harry Dunn, vice president in charge, a contract was recently let to Dominico Mozzacco of Florence, Colorado to drive the drift the remaining 216 feet. When complete, the tunnel will begin in Park County near Fairplay, cut through North Star Mountain under the Continental Divide, and end in Summit County. Cordillera Corporation owns a mill near the mine on the Park County side of the Divide, and the company plans to build a tram from the mine to the mill when ore production begins. Mining will probably start early in the spring, climaxing years of development work. Carl Merlino of Seattle, Washington owns the property.

After being closed down for several years, the *Passiflora Mines* on Ben West Hill near Westcliffe, Custer County, Colorado, are being reopened. A large headframe has been erected over the main working shaft and the necessary machinery and equipment are being installed. The management plans to drift on a silver-lead vein on the 200-foot level, and then will drive a westerly crosscut to work the four veins lying west of the shaft. The company owns about 100 acres covering almost all of the Ben West Hill crater area, and has shipped more than $350,000 worth of ore to the smelters from these properties. Charles A. Bliley is president of the company.

Bids are out for construction of access roads in the uranium area of southwestern Colorado, while work has been completed on access roads in the lead-zinc area of San Juan County. Other road work to be done in the state includes the resurfacing of 33 miles of State Highway 80, between Nicholas Wash and the junction with State Highway 145.

The Butterfly Mines, producers of lead, zinc, silver and gold at Ophir, Colorado, are leased to the *Mariposa Mining Company*. The new company will be backed by Thomas Kattnig of Milwaukee, Wisconsin and managed by George McCall. The *Butterfly* property is being reopened and readied for production.

A new gold-bearing vein has been discovered on the 3,100-foot level of *Golden Cycle Corporation's Ajax* mine at Victor, Colorado. Grab samples from three rounds of ore, cut while driving along the Bobtail vein on the bottom level, showed gold values of $750 per ton. Other levels show lower, but nevertheless, mineable values.

Telluride Mines, Inc., operator of the *Smuggler-Union* gold-lead-zinc mine at Telluride, San Miguel County, Colorado, has signed a new one-year labor contract with its employees, according to C. F. Parker, Jr., manager. All employees are now given a straight classification instead of being classified as mine or surface. Paid holidays, a change in vacation qualifications, and a straight five cents per hour wage increase for 15 worker classifications are provided for in the contract, which became effective on November 1, 1952.

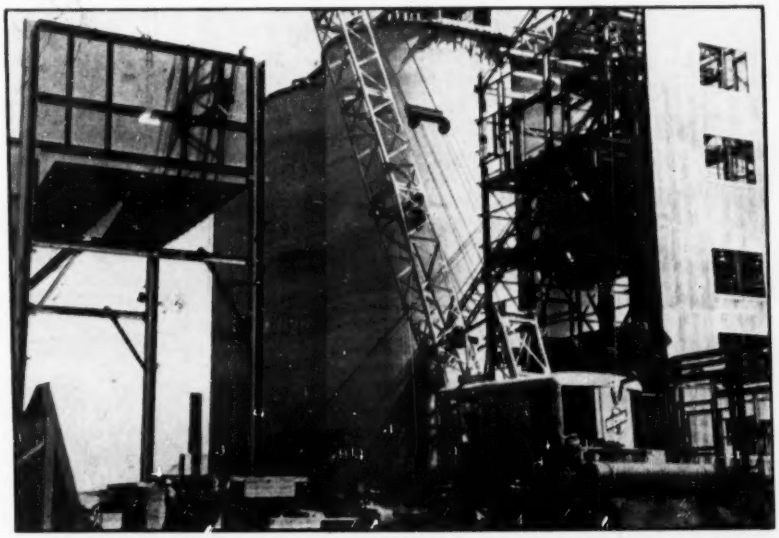
At the *Sweet* mill, located in the Montezuma mining district, Summit County, Colorado, a bunkhouse is being installed so that work can continue throughout the winter.

The *Gateway Mining and Development Company* of Grand Junction, Colorado, has been granted a $52,000 mining exploration loan by the Defense Minerals Exploration Administration. The money will be used in a diamond drilling and exploration program in the Gateway area, with repayment of the loan depending on the success in locating and producing uranium. R. C. Hartman of Menomonee, Wisconsin is president; Jake Lewis is a local board member; and John Schuman is mining consultant.

Buckskin Joe Mines, Ltd. is continuing regular shipments of gold-zinc ore from its *Phillips* mine at Alma, Park County, Colorado, to the *Resurrection Mining Company's* custom mill at Leadville, Colorado. The Phillips was first worked in 1859 as a gold mine, and then developed into one of Colorado's leading zinc producers during World War II. At present six men are employed at the mine under the direction of Joe Thibodeau, foreman.

Plateau Mines, Inc. has been incorporated by A. J. Watson of Grand Junction, Colorado, to "prospect, refine, sell and deal in uranium and vanadium ores." Also incorporated recently was the *Lilly Belle Mining and Milling Company* at Gunnison, Colorado. Partners in this venture, which has a capitalization of $100,000, are Walter B. Ross, C. E. Smith and Donald K. Houseman.

Recent ore shipments from Colorado's *Pride of the West* mine in Cunningham Gulch, San Juan County, show nearly an ounce of gold per ton, plus good lead content. Silverton miners leasing the property are O. F. Olsen, Frank Hitti, Barney Blackmore, and Lee Richards.



INTERMOUNTAIN CHEMICAL'S NEW PLANT

Construction is more than 80 percent complete at the Intermountain Chemical Corporation's new $16,000,000 trona plant and mine, 20 miles west of Green River, Wyoming. The 1,600-foot production shaft to supply trona to the new mill is ready for installing machinery. The two-story office building is also finished, as are six storage silos for finished product inventory, settling tanks, filter houses, a calcining plant, machine shop, and store houses. The photograph above shows the storage silos and the shipping building. Loading facilities are in the left foreground. More than 600 men are employed, with 200 at the mine and plant, and 400 in construction work for Bechtel Corporation and its subcontractors. C. A. Romano is resident manager.

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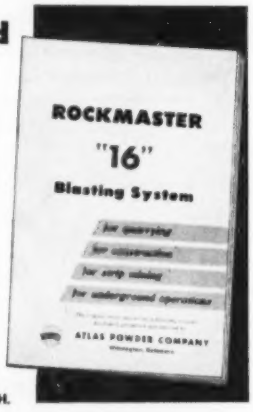

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At the *Resurrection Mining Company's* mill a number of new ore bins are being built to speed up handling of custom ore shipments. Both the mining and milling operations are located in Leadville, Lake County, Colorado.

SOUTH DAKOTA

Diamond core drilling for carnotite is underway in the Edgemont district of South Dakota's Black Hills, according to Howard Stafford, local U.S. Atomic Energy Commission chief. He reported that thus far all the ore from the Edgemont district has been carnotite type, and that radioactive samples have been found in other parts of the Hills. The AEC is directing a core and non-core drilling program covering a minimum of 10,000 feet and a maximum of 20,000 feet. The purpose of the diamond drilling, Stafford said, is to "obtain more information faster." The area to be explored is small, with maximum measurements being four by six miles.

Two large mining companies, *Homestake Mining Company* and *U. S. Vanadium Corporation*, have staked claims in the uranium fields of Craven Canyon north of Edgemont, South Dakota. Homestake has filed 18 claims; *Union Carbide and Carbon Company*, 40 claims; and U.S. Vanadium, 4 lode location notices. The latter company is licensed by the AEC to buy uranium, and has shipped approximately 3,000 tons of ore from the area during the past year to its Rifle, Colorado plant for refining. Most carnotite has been shipped by truck thus far, but it is expected that the newly constructed shipping depot at Edgemont will be in use soon.

The bentonite deposits of South Dakota are nearly exhausted, according to Ken Arthur, manager of the *Eastern Clay Products* bentonite plant at Belle Fourche. He reports that the three plants in Belle Fourche, which shipped 9,575 cars in 1951, now get their bentonite from Wyoming and not from South Dakota.

U. S. Senator Francis Case said that the Defense Materials Procurement Agency may divide with the state of South Dakota the cost of testing a process for the development of the *Chamberlain* manganese ores located along the Missouri River south of Pierre. The tests, sponsored by the South Dakota Natural Resources Commission, will cost $4,500.

WYOMING

A new process has been invented to successfully treat ores from Wyoming's huge *Iron Mountain* deposit, the nation's second largest known reserve of titaniferous magnetite. The process involves roasting a mixture of the ore and sodium carbonate at 950°C. and then leaching it in water. Not only has high-grade iron been recovered, but so have substantial amounts of vanadium and titanium.

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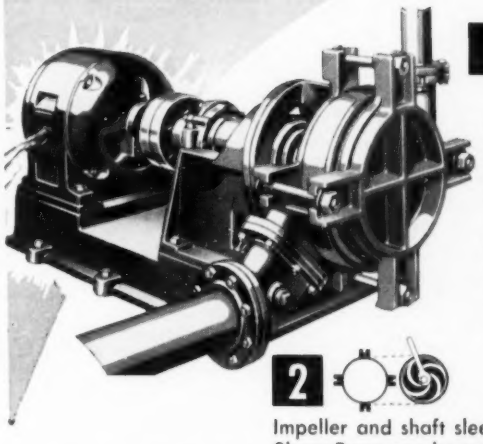

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been reactivated and immediate plans call for about a mile of core drilling. To date a shaft has been opened and a 60-foot tunnel cleared. The Defense Minerals Exploration Administration is going to pay half the expense of the core drilling and if core tests are suitable, a loan application will be made to the Reconstruction Finance Corporation. Patrick W. Dinneen and Harry E. Ferguson, the lessees, hope to incorporate soon. Under the terms of the agreement with the state of Wyoming, the latter will get a five percent royalty on all ore which is valued at more than $10.00 a ton. The Copper King has been idle for 50 years.

UTAH

According to reports, lead-silver mineralization has been struck at the *Mono-Kearsarge* property in the Ophir mining district of Utah. This mineralization, some 25 feet in length and from 6 to 8 feet in width, occurs as an irregular replacement of the Madison limestone in contact with porphyry. *U. S. Smelting, Refining and Mining Company* has leased the property since 1950 and works through its adjoining *Hidden Treasure* mine.

The *X-Ray Equipment Company* of Salt Lake City, Utah, has set up spectrometer and fluoresence analysis equipment at 5221 S. Major Street, Murray, Utah, for examination of carnotite, columbite, titanium, chromium-nickel-cobalt ores, and rare earths.

Following two years of geological exploration, the *Ancient River Channel Gold Mining Company* of Las Vegas, Nevada, will invest $50,000 in immediate exploration and development of its *Mineral Hills* uranium property in Marysvale, Utah. Plans call for sinking of an incline shaft to intersect the junction of the two major sheer zones present on the property. Surface excavation work has been completed, as has a raise of approximately 120 feet from the adit level to the surface, thereby providing ample circulation for some time to come. The 30° incline shaft has been started, and will be driven through with no work stoppage.

Western Phosphates, Inc. has begun construction of its treble superphosphate fertilizer plant at Garfield, Utah. The company, which was recently formed by *Kennecott Copper Corporation, American Smelting and Refining Company* and *Stauffer Chemical Company*, is headed by John Paul Jones. The plant is to be completed within a year, and will have a concentrated superphosphate capacity of 75,000 tons annually. Production rate, however, will depend upon the volume of ammonium phosphate and phosphoric acid manufactured at the plant. Fertilizer products will be made by use of the "wet" or sulphuric acid process in treating phosphate rock mined at the Stauffer deposits at Leefe, Wyoming. The phosphates produced at Garfield will be marketed west of the Mississippi.

Vitro Chemical Company of Salt Lake City, Utah, has doubled the capacity of its uranium ore reduction mill during the past year, according to W. B. Hall, plant superintendent. The mill is the largest nonvanadium (carnotite) uranium processing plant in the United States, and has been in operation one year. Autunite ore for the mill comes from Utah's Marysvale district, largely from *Vanadium Corporation of America* and *Bullion Monarch Mining Company*. Asphaltic ores are shipped to the mill from Emery County's Temple Mountain district, with *Consolidated Uranium Company* among the largest shippers.

Kennecott Copper Corporation will build a $1,250,000 research laboratory on the University of Utah campus to carry out research for the company, with the university eventually acquiring the building and equipment. Some 50 scientists and technicians will be employed by the mining concern. The researchers will engage in basic studies relating to mineral recovery problems of all of Kennecott's western mining divisions. A regular part of the work will be investigation of the treatment of ores and minerals from many parts of the world in connection with Kennecott's expanded exploration activities. S. R. Zimmerley, director of research for Kennecott and former U.S. Bureau of Mines Metallurgist, will direct the Kennecott staff.

Unprecedented shipments of iron ore from Iron County, Utah are being made on a group of ten tramp steamers sailing between Long Beach, California and tonished steamship owners, who are aware of the large iron mining industry which exists in Canada's maritime provinces. The ore comes from *Utah Construction company*.

High-grade iron ore averaging 50 percent is being removed from an open pit more than a mile square by *Columbia Iron Mining Company*, Iron Mountain, Utah. The operation, which encompasses three orebodies, is producing 200 railroad cars per day and company officials announce that the orebodies will be worked to considerably greater depths. Slopes on the mine have been established on a regular pattern of 35-foot benches; in one spot, the mine has reached a depth of 200 feet.

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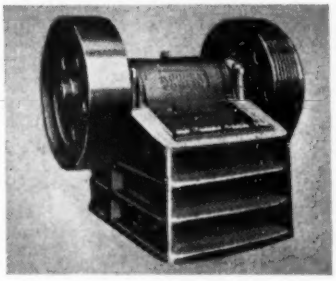

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4—DA35 Drifters
1—J2 IR Electric Bit Grinder
1—6D Drill Steel Sharpener
1—20'x8' Thickener
2—30 KVA 2300/440 transformers
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3	1000	Whse.	514	600	11000/6600
4	1000	G.E.	514	600	11000/6600
1	1000	G.E.	514	600	2300
1	500	C.W.	720	275	2300/440
1 (3-U)	500	Whse.	1200	250	440
2	500	C.W.	720	575	2300/440
2	250	Whse.	1200	125/250	2300
1	200	Ridgway	900	275	2300
1	155	G.E.	720	250	2300/440
2	150	Whse.	1200	250	2300
1	100	Al.Ch.	1200	125/250	4000/2300
1	100	Delco	1200	125/250	440/220
1	100	Ridgway	1200	275	4000/2300
1	100	C.W.	1200	125	440/220
1	85	C.W.	1200	250	440/220
1	75	Al.Ch.	900	250	2300
1	75	Whse.	900	75	2300
1	50	Burke	1750	250	440/220
1	25	Ideal	1750	125	220
1	25	Al.Ch.	1200	250	440/220
1	20	Al.Ch.	1200	250	440/220
3	15	Al.Ch.	1200	250	440/220

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3-Phase—60 Cycle

QU.	HP	MAKE	TYPE	VOLTS	R.P.M.
1**	1800	G.E.	MT-498	2300	357
1**	1200	G.E.	MT-26	2200	277
2**	1000	Al.Ch.	ANY	2200	235
1	800	G.E.	MT	2200	440
1**	600	G.E.	MT-20	2200	360
2	500	G.E.	1-16-M	2300	450
1**	400	Al.Ch.	ANY	2200	514
2	400	G.E.	MT-412	2200	450
1	250	Whse.	CW-937	449	1200
1	250	Al.Ch.	ANY	440	720
1	250	G.E.	MT-414	2200	300
1	200	G.E.	1-16-M	2200	600
1	150	G.E.	1-13-M	2200	1750
1	125	Whse.	CW-870	2200	900
1	100	Whse.	CW-766	440	1200
1	100	F.M.	H-20-C	440	900
2	100	G.E.	1-15-M	2300	514
1	75	Whse.	CW-7540	440	720
1	60	Whse.	CW	440	900
1	50	G.E.	MT-536	2200	1200
2	50	Al.Ch.	ARY	440	900
1	50	F.M.	SR	440	600
1	40	Al.Ch.	ARY	440	900

From our stock we can furnish manual and magnetic primary and secondary controls up to 3500-HP.

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3-Phase—60 Cycle

QU.	HP	MAKE	P.F.	VOLTS	R.P.M.
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1	4350	C-W	100	13,200/6600	514
1	3000	Whse.	80	4800/2400	720
2	2100	G.E.	100	2300	360
2	1750	G.E.	100	2300	3600
1	1000	El. Mchy.	100	440	1200
1	750	G.E.	80	2300	450
1	700	G.E.	80	2300	720
1	250	G.E.	100	2300	514
1	250	El. Mchy.	80	440	400
2	200	Whse.	80	440	1200
1	190	G.E.	80	440	720
1	150	G.E.	100	2200	900
1	150	G.E.	100	550	600
1	150	G.E.	80	550	450
3	135	G.E.	80	4000/2200	1200
3	125	El. Mchy.	100	4800/2400	900
1	125	G.E.	80	2200	900
2	100	Whse.	80	440	1800
1	100	Ideal	80	440	900
2	100	G.E.	80	440	600
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2	50	G.E.	80	440	600

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1—500 HP Wellman-Seaver-Morgan Double Clutched Steel Drum Slope Hoist. Will spool 2000' of 1¼" rope.
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4—200 KW G.E. full automatic switchgear
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4—200 KW G.E..
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INDEX OF ADVERTISERS

Agence Miniere et Maritime 99
Allen-Sherman-Hoff Pump Co. Inside Front Cover
Allis-Chalmers Mfg. Co. (Gen. Machinery Div.) 71
Allis-Chalmers Mfg. Co. (Tractor Div.) 1
Allison Steel Mfg. Co. 102
Alloy Steel & Metals Co. 6
American Cyanamid & Chemical Corp. 27
American Manganese Steel Div. 46
American Potash & Chemical Corp. 16
American Smelting & Refining Co. 86
American Zinc, Lead & Smelting Co. 90
Anaconda Copper Mining Co. 26
Anaconda Wire & Cable Co. 18
Arizona Rare Metals Laboratory 100
Arizona Testing Laboratories 99
Atlas Powder Co. 96

Beach & Co. 99
Behre Dolbear & Co. 75
Bemis Bro. Bag Co. 79
Bennett's Chemical Laboratory 99
Berry, Inc. 103
Black & Deason 99
Bodinson Mfg. Co. 58
Boyles Bros. Drilling Co. 92
Buckman Laboratories, Inc. 104
Bucyrus-Erie Co. 22
Bunker Hill & Sullivan Mining & Concentrating Co. 90
Business Men's Clearing House 101

Card Iron Works, C. S. 70
Caterpillar Tractor Co. 13
Coal Mine Equipment Sales Co. 103
Collins, Glenville A. 99
Colorado Assaying Co. 99
Colorado Fuel & Iron Corp. 16
Columbian Steel Tank Co. 96
Consolidated Pneumatic Tool Co. 20
(World Mining)
Cummins Engine Co. 2
Custom Assay Office 99

Darien Corp. 102
Deister Concentrator Co. 75
Denver Equipment Co. 10, 11
Denver Fire Clay Co. 67
Detroit Diesel Engine Div. (Gen. Motors Corp.) 21
Diamond Drill Contracting Co. 100
Dickinson Laboratories 99
Differential Steel Car Co. 56
Dings Magnetic Separator Co 19
Dorr Co. 44

Edwards Wire Rope Co. 24
Eimco Corp. 62, 63
Outside Front Cover
Emsco Concrete Cutting Co. 86
Euclid Road Machinery Co. 48

Federal Pipe & Tank Co. 101
Florence Machinery & Supply Co. 102

Galigher Co. 74
Gardner-Denver Co. 66
Gilmore, R. L. 99
Goodall Brothers 99
Goodall Rubber Co. 93

Hanks, Inc., Abbott A. 99
Hardinge Co. 70
Harnischfeger Corp. 42
Hartley, Gerald B., Jr. 99
Hassler, Warren G. 100
Hawley & Hawley 100
Hewitt-Robins 52, 53

International General Electric Co. Inside Front Cover
(World Mining)
International Harvester Co. 7
International Smelting & Refining Co. 90

Johnson, Herbert Banks 75

Keegel, C. P. 99
Kelly, John E. 99
Kennametal, Inc. 67
Kirk Co., Wallace E. 100
Krumlauf, Harry E. 99

Lane, Joseph 99
Ledeen Mfg. Co. 68
Ledoux & Co. 100
Leschen & Sons Wire Rope Co. 89
Le Tourneau, Inc. R. G. 4, 5
Link-Belt Co. 68, 69
(World Mining)
Lintz, Mark 99
Lundberg Explorations Ltd. 75

MacCabe Co., T. B. 103
Mace Co. 58
Magma Copper Co. 90
Marion Power Shovel Co. 17
(World Mining)
McClintock, R. S. 100
McNeil, Clayton T. 99
Meissner Engineers, Inc., John F. 75
Merrick Scale Mfg. Co. 96
Midwestern Machinery Co. 64
Miller, Arnold H. 99
Miller Machinery Co. 103
Mine Safety Appliances Co. Inside Back Cover
Mine & Smelter Supply Co. 72
Minerals Laboratory 100
Moos, Stanley M. 99
Morris Machine Works 97
Morse Bros. Machinery Co. 101
Murphy, F. M. 99

National Malleable & Steel Castings Co. 76
Neal Co., H. T. 75
New World Exploration, Research & Development Corp. 100
Nordberg Mfg. Co. 9

Osmose Wood Preserving Co. of America, Inc. 85

Pacific Foundry Co., Ltd. 16
(World Mining)
Pacific Pipe Co. 96
Peale, Rodgers 99
Phelps-Dodge Refining Corp. 98
Piggot Projects 100
Pittsburgh Lectromelt Furnace Corp. 15
Portland Woolen Mills 68
Precision Radiation Instruments, Inc. 84
Price, Franklin L. C. 99

Resisto-Loy Co. 82
Richelsen, Walter A. 99

Samincorp 58
Sauerman Bros., Inc. 64
Skinner, Ltd., Walter 75
Smit & Sons, Anton 64
(World Mining)
Smith Engineering Works 17
Smith, Paul F. 101
Smith-Emery Co. 100
Sprague & Henwood 54
St. Clair, John Q. 99
Stearns Magnetic, Inc. 94
Stearns Roger Mfg. Co. 88
Stephens Adamson Mfg. Co. 12
Still, Arthur R. 99
Stowell & Co., W. H. 100
Sturtevant Mills 9
(World Mining)
Sullivan, F. J. 103

Tamping Bag Co. 100
Thew Shovel Co. 8
Timken Roller Bearing Co. 20
Traylor Engineering & Mfg. Co. 14

Udy, Marvin J. 75
Ultra Violet Products, Inc. 98
United States Steel Co. 69
Universal Dredge Mfg. Co. 100

Van Waters & Rodgers, Inc. 100
Vulcan Iron Works 82

Walvoord Co., O. W. 99
Wedge Wire Corp. 84, 98
Western Machinery Co. 3
Westinghouse Electric International 18, 19
(World Mining)
Wilfley & Sons, A. R. Outside Back Cover
Wilfley, Clifford R. 99
Wilson, Clyde H. 99
Wilson, Glenn B. 102
Winslow Engineering Co. 64
Wolf, Harry J. 99
Wood Assaying Co., Henry E. 100
Wright, Lawrence B. 99

Yuba Mfg. Co. 60

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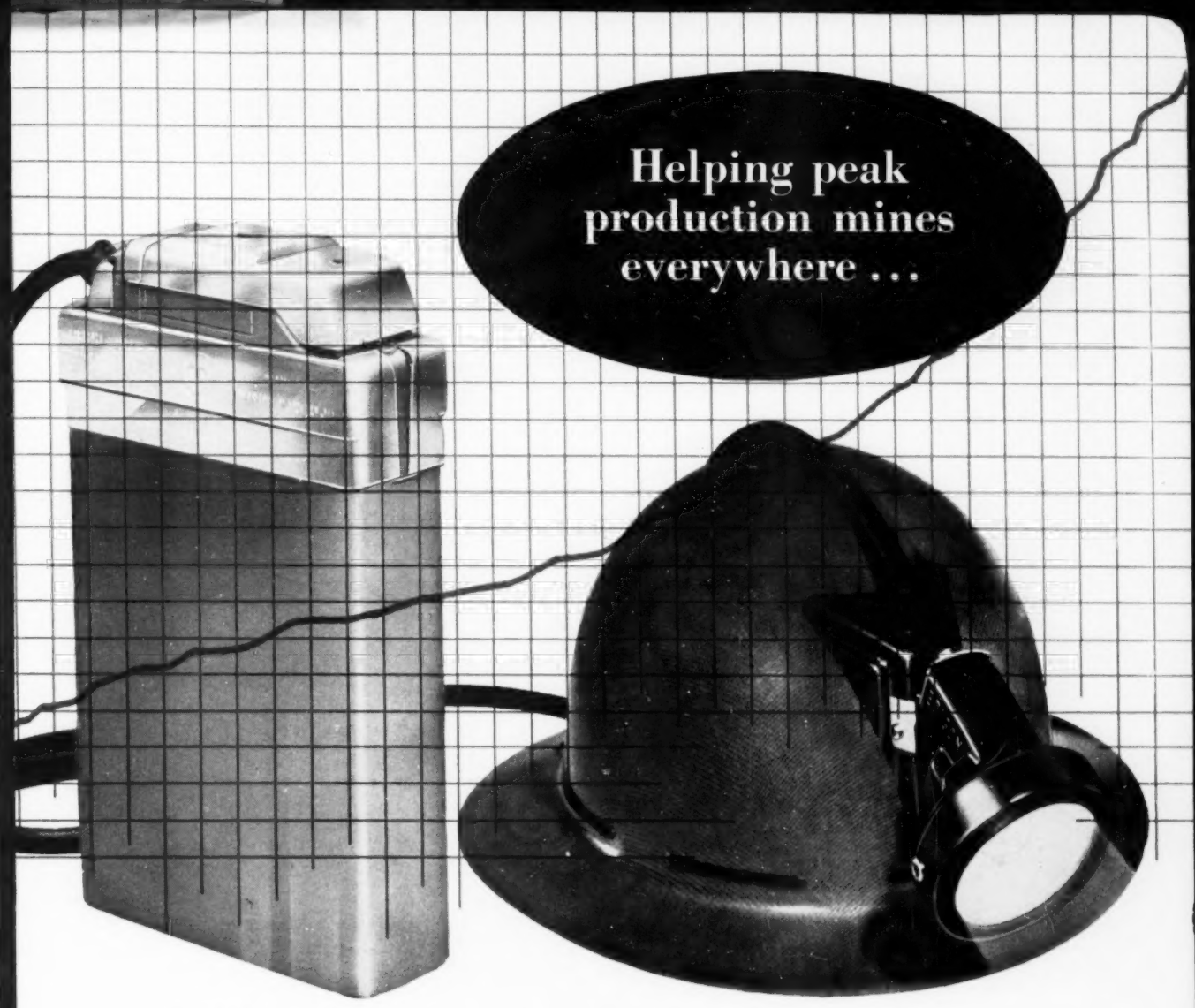

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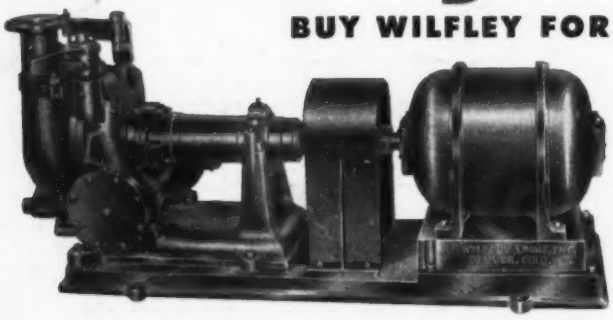

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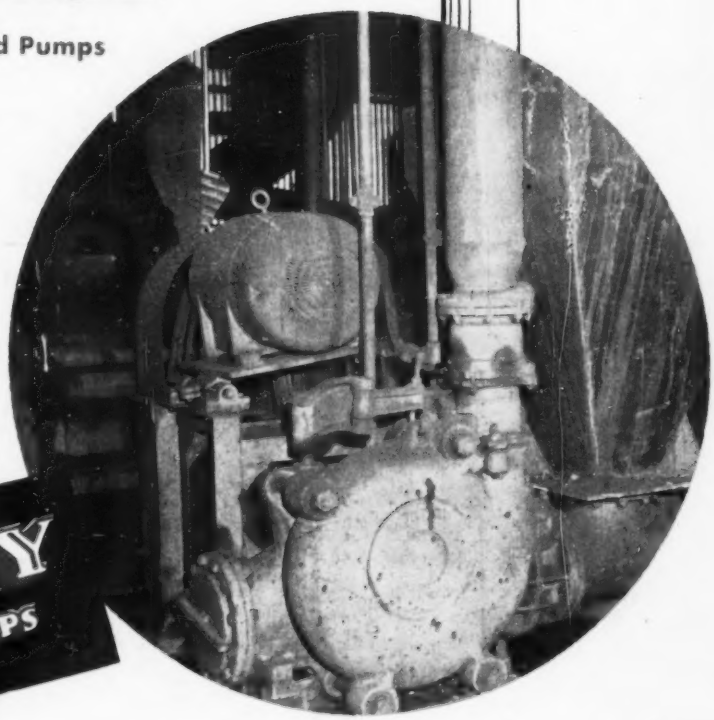

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